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Original Communications.

*ON THE BEVERAGES IN COMMON USE.**

By Professor Dujardin-Beaumetz.†

GENTLEMEN:—In the previous lectures I have spoken of complete and complex aliments; it remains for me to consider the drinks in ordinary usage, and this will be the subject of this day's lecture. For convenience I shall treat of beverages under three heads,—water, aromatic beverages, and alcoholic beverages.

Water plays an indispensable part in the alimentation of man, constituting more than two-thirds (seventy per cent.) of the bulk of the organism. It cannot, then, be omitted from the daily rations of man, and, if we include in our estimate the aqueous principles contained in foods, a man ought to consume three thousand grammes (or somewhat more than three quarts) of water a day.

I cannot here do more than touch upon this question, which is so important from a hygienic point of view, and if I were to attempt to treat the subject of drinking-waters with any proper degree of fulness I should require several lectures. Therefore I can only call

* A lecture on Hygienic Therapeutics. Translated from advance sheets.

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your attention to a few points of interest which have especial reference to hygienic therapeutics, then I shall briefly consider water in reference to certain general properties, and I shall lastly allude to the mineral waters (called table-waters), natural and artificial.

Water contains air and salts. The presence of air is absolutely necessary to render water potable. Boussingault insists that such water should contain at least from twenty-five to fifty cubic centimetres of gases per litre. These gases should consist of from eight to ten per cent. of carbonic acid, and of a mixture of oxygen and nitrogen containing from thirty to thirty-seven per cent. of oxygen and sixty-three to seventy per cent. of nitrogen.

When water is deprived of these gases it becomes "flat" and indigestible, as is the case with boiled water and the water that melts from the glaciers. Boiled water must first be aerated by churning before it is fit to drink, and glacier water becomes aerated naturally as it forms cascades in its course.

Are the salts also as useful as air in rendering water potable, and is drinkable water fairly represented by water which is chemically pure, corresponding exactly to the formula H_2O?

In France, since the experiments of Dupasquier, and those especially of Boussingault, the opinion prevails that the mineral ingredients, carbonates, sulphates, etc., must attain at least the figure of fifty centigrammes per litre in order that water may be fit for drinking purposes. These salts are absolutely necessary for the constitution of the skeleton, especially in the early life of man and animals. In England this view is not entertained, and Frankland has given expression to the opinion that as man finds in his food the quantity of lime necessary for his nutrition, the water which he drinks is the purer and better the more it resembles distilled and thoroughly aerated water. However this may be, when the proportion of calcareous salts is too high, the water becomes hard, and is liable to cause constipation.

Therapeutics has utilized the properties of these limy waters in the treatment of diarrhœa, persons suffering from this affection being often benefited by drinking the hard water of certain wells; and lime-water, which is the familiar combination of water and slaked lime, renders us great services in diarrhœas (especially in infantile therapeutics); the constipating properties of milk are augmented by the addition of lime-water.

Water contains a great number of micro-organisms, the study of which has so recently been made, and the schizomycetes of various waters have been analyzed. In this interesting line of study Marié Davy and Miquel, at the Observatory of Montsouris, have made valuable contributions. Taken in their aggregate, these micro-organisms may be divided into three groups. Those of the first are favorable to the health of those using the waters, those of the second are indifferent, those of the third injurious.

The first assimilate the carbon and eliminate the oxygen of carbon-dioxide; they aerate the water. This is the office of certain algæ containing chlorophyll, and especially the rôle of diatoms. The baneful micro-organisms consist of the microphytes of putrefaction. They set free nitrogen under the form of ammonia, and render the water putrid and injurious.

The waters of drinking sources may also contain the micro-organisms of infectious diseases, among which the bacteria of cholera and typhoid fever claim especial mention. Lastly, the ova of various entozoa may also infect sources of water-supply, and it is, as you know, through the contamination of water with the dejections of dogs infested with the Tænia echinococcus that man, drinking this water, becomes the victim of hydatid cysts.

Leaving one side the "infinitely little," one may, as Gérardin has shown, judge of the quality of any kind of water by its flora and fauna. As for the flora, if the water-cress (Nasturtium officinale) is not, as it is held to be in popular estimation, the health of the body, it is the health of the streams. Wherever it grows the water is wholesome, while, on the contrary, the duck-weed, or water-lentil (Lemna minor), always indicates a water of bad quality. As for the fauna, it is everywhere known that the water of streams which are deprived of fishes and mollusks is unfit for drinking purposes.

The temperature of water destined to be drank is a matter of some importance. Water when iced stimulates the digestive functions when taken in small quantity, and lowers the temperature. Liebermeister estimates this depression of temperature at 0.45° C., and Winternitz at 0.22° C. for the axilla. The usage of ice-water, however, when prolonged, leads to diarrhœa and intestinal irritation, and doubtless much of the gastro-intestinal disorder of countries where free use is made of ice-water is due to this cause.

As for the refrigerant action in general of

cold water, if it may be the determining cause of pulmonary and other congestions, as has been observed as a sequel to lavage of the stomach with too cold water, it may, nevertheless, be utilized as a powerful antithermic means in the febrile process: in fact, in pneumonia and typhoid fever we derive a real advantage from the use of cold drinks.

Warm water, on the other hand, determines a rise in the temperature of the body, and it may be affirmed that all our sudorific herb teas, with the exception of such as may contain jaborandi and its alkaloid pilocarpine, which act directly on the sweat-glands, owe their property not to the medicinal principles which they contain, but to their temperature. These hot draughts render us great service, as is known, in the initial periods of eruptive fevers, but they are likely to disturb digestion and provoke vomiting, and they do not quench thirst.

All parts of the digestive tube may absorb water. This is so true of the buccal mucous membrane, that liquor-tasters—a class of professionals whose business it is to test the quality of liquors by holding a mouthful, mingled with air, in their mouth, and then spitting it out—have been known to experience more or less intoxication from the simple testing of liquor in this way, and many a liquor-taster has become a drunkard. It is, however, in the intestine that the absorption of liquids principally takes place. Béclard has shown that water passes very rapidly into the intestinal canal. He has found it two minutes after being swallowed in the duodenum of a man the subject of a duodenal fistula, and, six minutes after being swallowed, in the cæcum of a horse.

I have in my hospital service instituted another series of experiments, showing with what rapidity water disappears from the stomach. In a patient affected with a slight degree of dilatation of the stomach, after having well emptied the gastric cavity by means of a stomach-pump, I introduced a quart of water. At the end of an hour there remained but a half-pint in the stomach. On frequently repeating this experiment, I have found that, on an average, a quart of water per hour will pass from the stomach into the intestine.

The water after being absorbed is rapidly eliminated by the kidneys; it never accumulates in the blood, and determines no alteration of the hæmoglobin. Leichtenstern, in an individual who had drank seven quarts of water, found no modification in the composition of the blood. This rapid absorption, and no less rapid elimination of water by the urine, sufficiently explain the diuretic effects of water, and my regretted master, Bouchardat, was right in saying that water is the best and most powerful diuretic.

The greater part of our mineral waters, called diuretic waters, such as Contrexville, Evian, Vittel, etc., are only such by virtue of being well tolerated by the stomach, and their ready absorption and elimination. This diuretic action of water is of exceeding importance, and the numerous applications thereof will be apparent in the course of these lectures. As for the action of water on nutrition, I shall not refer to this again. Already, in a previous lecture on the primordial alimentary principles, I showed you that experimenters have arrived at different conclusions, one party maintaining with Genth, Bischoff, Forster, Henneberg, Stohmann, Schmiedeberg, Germain-Sée, Albert Robin, that water augments the excretion of urea, and may be considered as an agent of disassimilation; the other party, basing itself on the very accurate experiments of Débove and Flamant, claiming that water has no influence on the excretion of urea, nor can it be said that the question is yet definitely settled. I come now to the subject of the table mineral waters.

In the volcanic region of Central France (Auvergne) we find a great number of springs charged with carbonic acid. These waters, which do not differ in their composition save in the quantity of carbonic acid which they contain, constitute our principal table mineral waters; chief among them are St. Galmier, Condillac, Chabetout, Morny-Châteauneuf, and De l'Ours. These table-waters are pleasant to take and of great purity. By the carbonic acid which they contain they quiet the stomach and regulate digestion. Their purity makes them especially sought after in times of epidemic. At the same time it will not do to use them exclusively, for they get the stomach accustomed to their stimulation so that it will not digest food without the help of its gaseous draught, and they eventually exhaust the stomach. Lastly, do not forget that certain patients are absolutely rebellious to the administration of these effervescent waters, which may provoke in such persons irritations of the digestive tube.

In connection with these natural mineral waters, I shall say something about the artificial seltzer waters, manufactured now on so large a scale. They are in reality not nearly so good as the natural, and by reason of the

low price of the latter, there is but little justification for the substitution.

Moreover, the closeness of union between the carbonic acid and the water which exists in the water as it flows from the springs cannot be imitated in any artificial combination. When the manufactured seltzer water is drank the gas escapes with too much force and volume, and may oppress the stomach; besides, the gas with which the water is charged may contain impurities from faults in its fabrication. Moreover, the presence of the carbonic acid in the water is no guarantee of the purity of the latter, whose source may not have been free from pollution. Lastly, according to Armaud Gautier, the metallic armatures of the siphons contain lead, and this metal is almost always found in the artificial seltzer waters.

I have finished what I had to say regarding water, and I come now to our second division, which comprises the aromatic beverages.

Under the head of aromatic beverages I propose to speak exclusively of such as contain a certain alkaloid, with the formula $C_8H_{10}N_4O_2$, which Runge, in 1820, found in coffee, and to which he gave the name *caffeine*, which Oudry, in 1827, found in tea, and which he called *theine*, which Martins discovered in the Paullinia sorbilis, and which finally Hæckel and Schlagdenhauffen have isolated, along with theobromine, in kola nuts.

In order to simplify the exposition into which I am about to enter, I will admit that all these alkaloids are identical, although I know very well that it is by no means demonstrable that isomeric bodies have absolutely the same physiological action. I shall not touch upon the different hypotheses which have been put forth relative to the atomic composition of this body. I have already called attention to this point in a recent study on the derivatives of caffeine.* I have shown that if, according to Strecker, caffeine is only the methyltheobromine, according to Fischer, on the contrary, caffeine and theobromine are derivatives of xanthine; theobromine is the bimethylxanthine, while caffeine is the trimethylxanthine. But I cannot now take up your time with these chemical researches.

All the aromatic beverages containing caffeine (or the isomeric alkaloids above mentioned) for their bases are used in immense quantities all over our globe, and their employment is much more extensive than that of alcoholic beverages.

Many opinions have been put forth as to the physiological and hygienic action of coffee. These may be reduced to three hypotheses. Coffee diminishes the excretion of urea and is a waste-restrainer; it does not modify the urea excretion, and is a force-producer; or, lastly, it acts as a food, supplying elements of nutrition.

The first view is supported by Schultz, Gasparin, Boker, Lehman, Frœlich, Trousseau and Pidoux, Rabuteau, Marvaux, etc., who claim that coffee diminishes the quantity of urea excreted; that it does not nourish, but that it prevents denutrition. This is the waste-restraining-aliment theory.

But to facts advanced by these physiologists other facts are opposed, and we see Roux and Giraud in France, Binz in Germany, Brackenridge in England maintain that coffee, as well as caffeine, in no respect modifies the figure of urea. Hence Gubler, basing himself on the researches of these authorities, affirms that coffee has no action on nutrition, but that it is a tonic, or, rather, a force-producer.

Lastly, Payen has shown that coffee contains nitrogen, and this in quite notable proportion, since in green coffee this essential element exists in the proportion of 4.48 per cent., and in roasted coffee in the proportion of 1.75 per cent. He shows, moreover, that the admixture of coffee with milk, in ordinary usage in many parts of the world as a breakfast beverage, is one of the most nutritious of all drinks, a mixture of 500 gms. of infusion of coffee, 500 gms. of milk, and 75 gms. of sugar containing, according to his estimate, 49 gms. of nitrogeneous substance and 100 gms. of hydrocarbon and salts.

This view has been adopted by Fleury, Bouchardat, and Jomand, and is supported by facts, being in accordance with the experience of entire populations (in England, Germany, Switzerland, and the United States), who find sustenance in their breakfast dish of coffee.

Coffee is, then, by virtue of the nitrogen which it contains, a food, and you remember that in the primordial alimentary principles I included caffeine among the azotized substances. Moreover, recent experiments of Guimaraës show positively that augmentation of urea follows the administration of coffee.†

* Dujardin-Beaumetz, "On the Physiological and Therapeutic Properties of the Derivatives of Caffeine" (*Bull. de Thèr.*, 1886, t. cx. p. 241).

† Guimaraës, "On the Physiological and Hygienic Action of Coffee" (*Arch. de Phys.*, 1884, t. iv. p. 253).

But is coffee anything but an aliment? It possesses special tonic properties on the circulation and nervous system. All experimenters are agreed in the fact that under the influence of coffee the beatings of the heart become more rapid and more energetic, the circulation more active, and the urine more abundant. Leblond's study has given us in this regard tracings of high importance. Moreover, whether by the activity which it impresses on the circulation, or by a direct action on the nervous elements, coffee directly affects the brain, and may be called "a cheering and thought-inspiring beverage."

This threefold action, on nutrition, on the circulation, and on the nervous system, makes coffee an admirable tonic, and we are justified in saying that it is largely by reason of the strong coffee, which habitually forms a part of their diet, that our troops have been enabled in the burning climate of Algiers to endure the most exhausting campaigns.

It is also owing largely to the coffee, which is becoming more and more an article of daily consumption among the farmers in the country, that we see this class of people able to endure the great increase of toil to which they are subjected in haying and harvesting seasons.

Coffee, in order to be fit for nutrition, must first be torrefied. Payen has made a special study on the modifications which coffee undergoes by roasting, and has shown that during this process there is a breaking up of the chlorogenate of potassium and caffeine, and a setting free of a part of the caffeine held in combination.

I cannot here touch upon the different modes of preparing coffee, modes by which the properties of roasted coffee are doubtless more or less modified. While in Europe it is the infusion which is drank almost exclusively, the inhabitants of the East prefer the decoction, and, if we may believe their statement, the decoction, while preserving the tonic and alimentary properties of the coffee, is quite devoid of the exciting properties which characterize the infusion.

The different physiological properties of coffee have caused this food medicine, and its congeners, tea, Paraguayan maté, guarana, and kola, to be applied to the treatment of a great number of affections. Its tonic action on the circulation has led to its use in the treatment of diseases of the heart, and Gubler, Lépine, and Huchard have shown us all the advantages derivable therefrom. Its diuretic properties have led to its being recommended in dropsies, urinary gravel, and gout. Its cerebral tonic action has rendered it useful in the treatment of migraine and cephalalgia. Lastly, we see its utility recognized in intestinal strangulations and opium-poisoning.

I have finished what I wished to say concerning coffee, leaving aside what appertains to infusions made from roasted acorns and chiccory, which contain nitrogen, and probably have some food value, but are devoid of caffeine, and therefore of the tonic and excitant properties of coffee.

It remains for me to speak of alcoholic beverages. This is a topic of special interest and importance, and you will permit me to dwell on it at some length. We will study successively alcoholic beverages in general, then the physiological action and digestibility of these beverages. As for alcoholic beverages in general, I shall divide them into three classes: the first includes wine; the second, cider, perry, and beer; the third, distilled spirits and aromatized liquors.

Wine.—It is a profound mistake to suppose that wine is only a mixture of water and alcohol. It is a complete *living whole*, if I may so express myself, all the elements of which constitute so complex and homogeneous an aggregate that we cannot alter any one of them without introducing profound modifications into the composition of the wine. Apart from the water and the alcohol, wines contain glycerin, tannin, essential oils, ethers, salts, and, in particular, tartrates; and, according to the period when you examine the wine, the quantity of these different elements varies.

Wine is, in fact, as I just told you, a living thing, by the fermentations which it undergoes. It has its youth, its maturity, and its old age. Such crude wines as those of Burgundy are short lived, and their old age is early. Other crude wines, like those of Bordeaux, have a much longer life, and to hasten their maturity are even sent to distant places. Lastly, wines have their diseases, which generally result from want of skill in their fabrication, and from a vicious fermentation determined by the presence of impure products.

The following table from Chevalier and Bandrimont gives the percentage of alcohol in different wines:

Wine of Marsala	23.83
" " Red Madeira	20.52

Wine of White Madeira	20.00
" " Port	20.00
" " Bagnols	17.00
" " Malaga	17.42
" " Roussillon	16.88
" " Malaga	15.00
" " Chypre	15.00
" " Red Jurançon	13.70
" " Lunel	13.70
" " d'Angers	12.90
" " Champagne	12.77
" " Grave	12.30
" " White Beaune	12.80
" " Frontignan	11.80
Effervescent Wine of Champagne	11.77
Wine of Cahors	11.36
" " White Mâcon	11.00
" " Volnay	11.00
" " Orléans	10.66
" " Red Bordeaux	10.10
" " Larose	9.85
" " Pouillac	9.70
" " White Vouvray	9.66
" " Château-Latour	9.33
" " Léoville	9.10
" " White Pouilly	9.10
Wine on retail in Paris	8.80
Wine of Château-Margaux	8.75
" " Château-Lafitte	8.73
" " White Chablis	7.88

By glancing over this table you can judge how variable are wines in respect to their richness in alcohol. From a fiscal point of view, all wines having more than twenty-five per cent. of alcohol are considered as liquors, and all that are above 15.90 per cent. pay double duties. This limit ought to be made even lower, and no wines that contain more than ten or twelve per cent. of alcohol should be allowed to pass for wines of ordinary consumption. Bear in mind, in fact, that our table wines, and our most celebrated raw wines,—the Château-Lafitte, the Château-Margaux,—do not contain more than 8.75 to 8.88 per cent. of alcohol, and that our wines of Central France scarcely have seven per cent.

If I insist so much on this point, it is because vehement debates have been aroused in our legislative assemblies and in the Academy of Medicine concerning vinage, or the alcoholic adulteration of wines. I am a thorough opponent of the right of vinage, which, by introducing into wines foreign spirits, modifies and profoundly changes the wine ; in fact, in my estimation, spoils it. By the commercial treaties which bind us to Spain, and which allow the introduction of wines with sixteen per cent. of alcohol, we see all the spirits of bad quality fabricated in Germany enter our country under the cover of wine.

These wines thus alcoholized entail deplorable consequences on public hygiene, and they have substituted for the drunkenness resulting from the abuse of wine all the worst evils of intemperance seen in other countries where alcoholic stimulants of bad quality are in common use, and we see the fruit of this abundant consumption of strong wines in the grave disorders of the nervous system and the other tissue-degenerating diseases now so prevalent.

But the limits of this lecture will not allow me to dwell further on the alcoholization of wines, which is a subject of the greatest importance.

From a medical point of view, wines may be considered under four heads,—the strong wines, the red wines, the white wines, and the sparkling wines.

The strong wines are those which contain fifteen per cent. or more of alcohol. These are generally dry wines, which, by their great richness in alcohol, are indicated in febrile maladies and states of prostration where stimulants are required. Unquestionably, the wines of Marseilles, of Madeira, of Malaga, also sherry and port, are superior to Todd's potion, which is ordinarily prescribed in our hospitals.

The red wines, by the tannin which they contain, are the tonic wines *par excellence.* Their intoxicating power is not necessarily in relation with the alcohol which they contain, but rather with the ethereal principles which enter into their composition ; and I need only remind you here of the distinction, so well recognized, between the Burgundy and the Bordeaux. The first, by the heady "bouquets" which distinguish them, excite the brain much more than the Bordeaux wines ; hence it is that the latter are the most often prescribed in sickness.

The white wines, which contain much less tannin than the preceding, because, being made from the black grape, they owe their white color to the fact that they were not kept in prolonged contact with the skins and pulp of the grape, contain, on the other hand, more of the potassic tartrate. They are the diuretic wines *par excellence*, and even Hippocrates noted their action on the kidneys. Certain of these white wines which are a little tart, when diluted with our alkaline waters, constitute an agreeable beverage and possess undisputed diuretic properties.

As for the effervescent wines, of which the type is champagne, they render us important service in medicine. By the carbonic acid they contain, and which is intimately com-

bined with them, they have a marked calmative action on the mucous membrane of the stomach; hence whenever, in cases of irritation of that viscus with vomiting (as in peritonitis), there is indication for an alcoholic stimulant, these sparkling wines serve a good purpose. Here we often find nothing better than iced champagne, whose effects not seldom are marvellous.

The second class of alcohols consists of the fermented beverages,—cider, perry, and beer; the two former, which are the product of the fermentation of apples and pears, are widely in use in France. Girard, the director of the municipal laboratory of Paris, who has made a careful analysis of cider, has shown that an ordinary sample of this fermented beverage contains five to six per cent. of alcohol, about three per cent. of ash, and watery extract in the proportion of about one ounce per quart. As for the sweet ciders, they contain a much smaller quantity of alcohol, which does not exceed 1.70 per cent.

Apart from the alcohol which enters into its composition, cider contains a large quantity of alkaline salts, phosphates, carbonates, malates, etc.; hence it is that cider is diuretic, and Denis Dumont has highly extolled the usage of this beverage in the treatment of gout and the uric acid diathesis. The considerable proportion of potassic salts which it contains also renders it slightly purgative; and hence it is that cider is much resorted to by some persons for a laxative effect.

Compared with cider and perry, beer, ale, and porter are of much more general usage, and it may be affirmed that in Europe there are more beer-drinkers than wine-drinkers.

Beer, as you know, results from the fermentation of the starch contained in certain grains. During germination the starch of the grain is transformed by the vegetable diastase into grape-sugar, and this natural process is utilized in the fabrication of beer by the fermentation or maltage of barley. To this sweet infusion of malt or wort is added infusion of hops, which communicates its special taste, and the fermentation is effected either under heat or cold.

We find in the fermentation of beer a demonstration of the laws established by Pasteur, that each of these fermentations has its special organic conditions, the high yeast corresponding to the fermentation which takes place at from 15° to 20° C., and the low yeast corresponding to that which takes place at 4° or 5° C. Lastly, an impure kind of malt yeast—the saccharomyces Pastorianus of Ress—produces a bad fermentation of the beer.

These beers, if we may trust Girard's analysis, which I place before you, contain a proportion of alcohol varying from three to seven per cent. The strongest beers, as you well know, are the English.

Beers which contain less than three per cent. of alcohol are called small beers, or beers of consumption, and must be drank as soon as made or they will spoil.

These malt liquors are very diuretic, and this property is largely proportioned to the quantity imbibed. The beer-drinker is not easily satisfied, for beer is a beverage that is not good to quench thirst. The more one drinks of beer the more he wants to drink, and it suffices to go through the breweries of certain countries, as those of Munich, to see what enormous quantities a man can drink. Some have been known to exceed twenty quarts a day. Fortunately, however, owing to the diuresis which it excites, a quantity so excessive does little but pass through the economy, transforming the beer-drinker into a veritable filter. This continued stimulation of the kidneys, however, is not unattended with serious evils, and we see renal degenerations follow the forced labor to which these glands are subjected.

CENTESIMAL COMPOSITION OF BEERS.

French Beers.	Alcohol. Mean.	Extract. Mean.	Ash. Mean.
Strasbourg	4.7	4.65	0.32
Lille	4.1	4.65	0.35
Paris	3.5	6.00	0.35
Nancy, Tantonville, etc.	5.6	5.70	0.9
Lyon	5.5	5.00	0.9
German Beers.			
Saxony	3.7	5.8	0.25
Bavaria	4.5	7.2	0.29
Hanover, Holstein, Pomerania.	4.2	5.9	0.25
Austrian Beers.			
Vienna, Moravia	3.5	6.1	0.20
Bohemia	3.6	4.7	0.20
English Beers.			
Ale of exportation	7.3	5.9	0.35
London porter	5.2	6.4	0.32
Belgian Beers.			
Lambic	6.02	3.7	0.32
Faro	4.15	4.2	0.32
Barley beer	4.35	3.4	0.32
Different beers	5.8	5.5	0.32

By the diastase which they contain these malt beers supply a nutrient which has a digestive action on the carbo-hydrate aliment-

ary principles; hence vegetarians ought to be beer-drinkers. Certain liquid malt preparations in the markets (Hoff's, Wyeth's, Nicholson's, etc.) are beers rich in diastase and dextrine. Lastly, there are medicinal beers charged with hops, scurvy-grass, horse-radish, pine-buds, Peruvian bark, and called "tonic," "antiscorbutic" beers, preparations very little used, at least in France.

The third group of alcoholic beverages comprises distilled spirits and aromatized liquors. The consumption of these liquors is everywhere on the increase. In some years it has been enormous, and there is no reason as yet to predicate a decreasing ratio. In France the quantity of pure alcohol consumed in 1850 was five hundred and eighty-five thousand two hundred hectolitres; the past year it has been four times that amount, or almost two million hectolitres.

All the efforts put forth by the various governments to stay the increase in the use of distilled liquors have thus far failed. Increased taxation of spirits, severe penalties against drunkenness, diminution in the number of grog-shops, none of these things have availed. The temperance societies themselves, notwithstanding the augmentation of their membership, and notwithstanding the rigorous exclusion of every kind of alcoholic beverage, have done but little to retard the progress of intemperance. I am assured, however, that this statement is not strictly true as applied to some parts of the United States.

We see in this almost universal spread of drunkenness one of the saddest facts connected with the age in which we live.

The alcohols due to fermentation constitute a natural chemical series, of which the formulæ go on increasing from ethyl alcohol to amyl alcohol, thus:

Ethyl alcohol, C_2H_6O; propyl alcohol, C_3H_8O; butyl alcohol, $C_4H_{10}O$; amyl alcohol, $C_5H_{12}O$.

In the work undertaken by Audigé and myself "On the Toxic Power of the Alcohols,"* we showed that the degree of toxicity of these bodies followed in almost a mathematical ratio their atomic formula, and the following tables which I place before you sum up the results which we obtained in our first experiments which pertained to acute alcoholism.

* Dujardin-Beaumetz and Audigé, "Experimental Researches on the Toxic Power of the Alcohols." Paris, 1886.

TABLE A.—DEGREE OF TOXICITY OF THE PRIMORDIAL ALCOHOLS.

Group of alcohols.	Designation of the alcohols and their derivatives.	Medium toxic doses per kilogramme of weight.	
		In the pure state.	In the state of dilution.
		Grammes.	Grammes.
Alcohols of fermentation.	Ethylic alcohol (C_2H_6O).	8.00	7.75
	Propylic alcohol (C_3H_8O).	2.90	3.75
	Butylic alcohol ($C_4H_{10}O$).	2.00	1.85
	Amylic alcohol ($C_5A_{12}O$).	1.70	1.50
Alcohols not of fermentation.	Chemically pure methyl alcohol (CH_4O).	.....	7.00
	Ordinary wood spirit.	.....	5.75
	Œnanthylic alcohol ($C_7H_{16}O$).	8	
	Cetylic alcohol ($C_{16}H_{36}O$).	7.50	
Iso-alcohols.....	Iso-propylic alcohol (C_3H_8O).	.....	3.70 to 3.80
Poly-atomic alcohols.	Glycerin ($C_3H_8O_3$).	.....	8.50 to 9.00
Derivatives of alcohols.	Acetic aldehyde (C_2H_4O).	.....	1.00 to 2.00
	Acetic ether ($C_2H_3O_2C_2H_5$).	.....	4.00
	Acetone (C_3H_6O).	.....	5.00

TABLE B.—DEGREE OF TOXICITY OF THE ALCOHOLS OF COMMERCE.

Ethylic alcohol and the alcohols of commerce.	Medium toxic dose, which, per kilogramme of the weight of the dog, will kill within 24 or 36 hours.	
	Crude spirit.	Rectified.
	Grammes.	Grammes.
Ethylic alcohol (dilute).....	7.75	
Fine wine spirit of Montpellier.....	7.50	
Brandy made from perry (by distillation)...	7.35	
Cider brandy, and that obtained by distilling the marc of grapes	7.30	
Alcohol obtained from grain.....	6.95	7.15
Beet spirit	6.90	7.15
Potato spirit (whiskey from distillation of potatoes).....	6.85	7.10
Potato whiskey, ten times rectified.....	.....	7.35

These results have been entirely confirmed by another series of researches, which lasted more than three years, and which pertained to chronic alcoholism, the subjects of the experiments being hogs. All these results may be summed up in this one sentence,—*the higher in the series the alcohol, the more toxic it is.*

All the spirits in common use contain variable proportions of the different alcohols of the series; but while wine spirit possesses but feeble quantities of propyl, butyl, amyl alcohols, as Ordonneau has shown, potato and grain spirit contain these higher alcohols in excess, and they can only be removed by successive rectifications.

Ordonneau, in an interesting work on the composition of distilled liquors, has brought to light this interesting fact, that the nature of

the spirit produced in a fermenting solution depends on the ferment employed. If the ferment is impure, there are generated iso-alcohols, while with a pure ferment you obtain the true alcohols. Despite the identity of formula which exists between the iso-alcohols and the alcohols properly so called, the toxicity of the former is much greater than that of the latter.

Manufacturers of spirits have of late found that certain amylaceous substances, and especially rice and maize, under the action of a pure ferment, such as that high malt yeast which we use in making galazyme, give origin to ethyl alcohols of almost absolute purity, not even needing rectification, so minute are the proportions of the more toxic alcohols (potato, butyl spirit, etc.).

Pure or absolute alcohol is only of interest chemically. Rectified spirit is alcohol with sixteen per cent. of water, sp. gr. .838. Proof spirit consists of an admixture, in nearly equal proportions, of alcohol and water, and the distilled liquors sold for ordinary consumption are intended to be of about this strength.

The following table shows the richness in alcohol of different commercial spirits:

	Alcohol.	
	By weight.	By measure.
British proof spirit contains.....	50	57
Commercial cognac "	...	50 to 54
Rum "	...	72 to 77
Gin "	...	50
Whiskey "	...	59
Rectified beet spirit "	...	94

Since the phylloxera has made such ravages with our vines, France, which, in its vine-growing departments, as Charentes, used to produce the best brandy in the world, has suffered such a falling off in the production of this spirit that one must to-day be a millionaire to be able to afford good brandy for his table; nor are we even sure of obtaining good brandy by paying twenty francs per litre for it.

But the brandy made from wine has been replaced by beet and grain whiskey, to the great detriment of the consumer. By referring to the table which I have given you,* you will see that if in 1875 France produced 348,723 hectolitres of brandy, in 1879 the quantity was only 4929 hectolitres, and 13,073 in 1882. These figures show pitiably when placed by the side of the 2,000,000 hectolitres of alcohol which we consume in France.

By the side of these spirits we must place the "liquors" of the retail shops and "*cafés*." The quality of these "liquors" depends on the kind of alcohol employed and the substance with which they are aromatized. Unfortunately, the flavoring ingredients introduced generally only serve to disguise the bad taste and bad quality of the alcohol used, and this is what happens in the case of low-priced liquors, and in particular of absinthe. As for the pretended stomachic and aperient substances with which the liquors of our drinking-saloons are "doctored," they have no healthy stimulant effect on the digestion, and all the bitter extracts, gentian, quassia, aloes, absinthe, etc., which, added to the whiskey or rum, constitute the basis of popular "bitters," have no favorable action whatever on the secretion of gastric juice, but rather retard and arrest it, as Tschelzoff, one of Prof. Botkin's clinical chiefs, has recently shown.† Those that think that they have derived benefit from them, in all likelihood have confounded the cramps of the stomach, which they may have experienced under the irritant action of these liquors, with the sensation of hunger.

I have finished this long enumeration of alcoholic beverages, and I shall conclude by saying a few words about the physiological action and digestibility of alcohol.

Alcohol is of itself an irritant, and, when applied to mucous membranes, it develops a sensation of heat and burning, which is the greater the more concentrated the alcohol. When introduced into the stomach, besides the symptoms of irritation, it occasions an exaggeration in the acidity of the gastric juice. The experiments of Charles Richet on Marcellin are very demonstrative of this fact.

In the normal state the acidity of Marcellin's gastric juice was represented by 1.3 gms. of hydrochloric acid per litre. During digestion the acidity rose to 1.7 gms.; but as soon as an alcoholic stimulant was introduced the acidity went up to 2.7 gms., and even 4 gms. per litre.

This is a capital point in the physiology of alcohol as far as its influence on digestion is concerned, and this property is utilized to a certain extent in all countries, and especially in Normandy, where it is a common custom to "make a hole," as they call it, in the mid dle of a meal by drinking a small glass of

* Omitted from the translation.

† Tschelzoff, "On the Influence of Bitters on the Digestion and Assimilation of Albuminoid Matters" (*Centralblatt für die Medicinischen Wissenschaften*, 1886, No. 24).

brandy. In this way the acidity of the gastric juice is augmented, and the stomachal digestion is increased. From this fact there arises an important indication,—to give to patients affected with dyspepsia from want of secretion of gastric juice a small glass of liquor after their meals.

But it will not do to prolong this action of the alcohols, for little by little the pepsin-glands become worn out and cease their functions, to give place to the increased secretion of the mucous glands. All our alcoholic dyspeptics go through about the same history. There is, first of all, gastric irritation with pyrosis, resulting from the exaggerated acidity of the gastric juice, then these symptoms give place to gastrorrhœa, characterized by the petuitous vomiting and dyspepsia of drunkards.

Alcohol, when ingested, is absorbed by all parts of the digestive tube, but especially by the intestines. It is taken up by the radicles of the portal vein, and passes into the hepatic circulation, where its presence determines portal periphlebitis, the origin of the cirrhosis of drunkards. Then it enters the general circulation, to be eliminated by the lungs and kidneys, whether in the state of unchanged alcohol or in that of acetic acid and aldehyde.

Many hypotheses have been put forth as to the physiological action of the alcohols. It is one of the most interesting of medico-physiological questions, of which I can only sum up here the leading points.

All these hypotheses may be reduced to two. The first is the theory maintained since 1860 by Lallemand, Duroy, and Perrin, which affirms that alcohol is neither transformed nor destroyed in the organism, and that the total quantity being eliminated unchanged, it cannot be considered a food. The other theory is that supported by my regretted master, Bouchardat, who claims that alcohol undergoes combustion and transformation in the economy, and therefore acts the part of a food. This is the view which I hold, and which I have defended to the best of my ability the past two years before the Academy.

You put together, I have said, in the circulating blood two chemical bodies, the one alcohol, having a strong affinity for oxygen, the other hæmoglobin, ready to yield up its oxygen under the most feeble influence, that of an inert gas, for instance, and you pretend that no exchange takes place between these bodies. Exchanges do take place, and I have demonstrated with my pupil, Jaillet, the transformation *in vitro* of alcohol into acetic acid under the influence of hæmoglobin. I believe, then, fully in the combustion of a part of the alcohol ingested, and this combustion takes place at the expense of the oxygen of the hæmoglobin of the blood-corpuscles.

This view, moreover, finds confirmation in the experiments of Bandot, Schalinas, Anstie, and Lauder Brunton, of Lussana, and Albertoni, all of whom have no doubt as to the combustion of a portion of the alcohol ingested.

So, then, to sum up my view as to the physiological action of alcohol, I should say that when introduced into the economy in non-toxic dose, a certain part of the alcohol is oxidized and is transformed into acetic acid, then into alkaline acetates, then into carbonates. Alcohol is, then, a food, but a waste-restraining food, which, instead of energizing the combustions, slows them, by robbing the blood-corpuscles of a certain quantity of oxygen. It is this action on the blood-corpuscles which explains to us the antithermic power of the alcohols, an action which attains its maximum of intensity when toxic doses of alcohol are administered. In such toxic cases the alcohol is no longer burned, but destroys the globules and dissolves the oxyhæmoglobin. Ordinarily, not all the oxygen ingested undergoes combustion. A part unchanged acts directly on the cerebro-spinal axis, and there determines phenomena of intoxication, of sleep, and of vaso-motor modifications, varying according to the quantity of alcohol ingested.

These three properties—alimentary, antithermic, and tonic—have made alcohol one of the most powerful agents of the antithermic treatment of disease, and I shall not here take your time in enumerating the numerous applications of alcoholic stimulants to medicine. I cannot do better than refer you for a vigorous handling of this whole subject to the thesis of fellowship of my former pupil, Prof. Grancher, "On the Tonic Medication," a thesis published in 1875. This finishes what I have to say about an agent which has a prominent place in hygienic therapeutics.

All the beverages considered in this lecture are taken at meal-time or between meals (the principal consumption is at meal-time), and the greater or less abundance ingested has a decided influence on the volume of the digestive tube. Dancel, basing himself on the fact that in veterinary practice one may augment or diminish at pleasure the dimensions of the

horse's stomach by augmenting or diminishing the quantity of water which the animal is allowed to drink, has also shown that it is the same with man; hence he would limit to half a pint the quantity of liquid which a corpulent person ought to take with his meal. Schweninger has gone further, and has suppressed all drinks from the dietary of obese patients, and he recommends that such persons shall not drink till two hours after meals. In the next lecture, when I come to the treatment of obesity, I shall take up this point again.

This abstinence from liquids, which has been described under the name of *the dry diet cure*, and which Fonssagrives calls *xerophagia*, has been also applied to the treatment of dilatation of the stomach. Hippocrates, Petronius, Asclepiades, and Muller had always pointed out the advantages of a dry diet in the case of serous effusions, and when there was an indication to dry up certain exaggerated secretions. This regimen has been revived in our time by Chomel in the treatment of what he improperly calls *the dyspepsia of liquids*, and by Huchard in combating dilatation of the stomach. In cases of gastrectasia, in fact, the allowance of liquids ingested augments the stomachal dilatation; hence there is every reason for restricting the quantity of drinks.

I have now concluded what I had to say concerning the principal elements of hygienic therapeutics, it remains for me to apply these data to the study of Dietetics; this is what I shall attempt to do in the next lecture.

A CONTRIBUTION TO OUR KNOWLEDGE OF FEVER, AND THE AGENTS WHICH PRODUCE OR ARREST IT.

By Drs. H. C. Wood, E. T. Reichert, and Hobart A. Hare.

(Continued from page 678.)

Part III.—Antipyretics.

QUININE.

THE first drug having alleged antiperiodic properties which we attempted to study was quinine. It is so notorious that this alkaloid has, unless in poisonous doses, no effect upon the temperature of the normal animal, that we do not think it necessary to record our experiments upon such animals in detail; if the bodily temperatures recorded in the table on page 734 are consulted, they will be found to confirm the general belief that quinine has no positive constant action upon the bodily temperature in health.

The following experiments were made in order to determine the effect of quinine upon the fever produced by injection of pepsin.

Experiment 35.—

Time.	
12.30.	Injected 6 grammes of concentrated pepsin into jugular vein of dog; ten minutes later injected ½ gramme of quinine.

Time.	Rec. temp.	Remarks.
1.20	101.4°	
4.20	105.3°	

Experiment 36.—April 24, 1884; dog; weight, 14.6 pounds.

Time.	Rec. temp.	Remarks.
11.25	102.8°	Injected 4 grms. of concentrated pepsin.
3.30	106.8°	Injected 1 gramme of quinine.
4.35	105.6°	
5.52	103.7°	

Experiment 37.—Dog; weight, 9 pounds.

Time.	Rec. temp.	Remarks.
11.30	102°	
12.	.....	Injected 2 grms. concentrated pepsin. Dog etherized.
12.20	101.2°	
3.15	106°	
4.50	104.2°	Injected 1 grm. quinine hypodermically.
6.05	104.2°	

Experiment 38.—Dog; weight, 26 pounds.

Time.	Rec. temp.	Remarks.
11.35	103.5°	5 grammes pepsin.
12.05	102.2°	1 gramme quinine hypodermically.
2.10	102.4°	

Experiment 39.—Dog; weight, 6.5 pounds.

Time.	Rec. temp.	Remarks.
11.30	102.8°	
3.15	103.2°	Injected 1 gramme pepsin.
3.20	.....	Injected hypodermically 0.5 gramme quinine.
3.30	102.7°	
5.00	103.4°	
7.00	103.1°	

These experiments, in accord with those to be detailed hereafter, indicate that quinine has a distinct influence in abating the fever produced by the injection of pepsin, but that this influence is not dominant and is not shown at all unless the dose of quinine used be large. The alkaloid appears in the dog as in the man to be an antipyretic, reducing temperature when circumstances favor it, but unable to assert itself at all times.

The next series of experiments were directed towards determining if possible the action of quinine upon heat production and heat dissipation.

Experiment 40.—Dog; weight, 25.50 pounds.

Time.	Rec. temp.	Cal. temp.
2.52	103.6°	66.80°
3.52	104.2°	69.01°
		2.21°

4.00 Injected 15 grains of quinine.

Time.	Rec. temp.	Cal. temp.
4.20	104.2°	68.45°
5.20	104.3°	70.04°
		1.59°

RESULTS.

Hourly dissipation of heat	269 62
Hourly production of heat	281.095
Hourly dissipation of heat	193.89
Hourly production of heat	195.89

SUMMARY.

Hourly heat dissipation before quinine	269.62
Hourly heat dissipation after quinine	193.89
Loss of heat dissipation after quinine	75.73
Heat production before quinine	281.095
Heat production after quinine	195.89
Loss of heat production after quinine	85.105

Experiment 41.—Same dog as last; weight, 25.50 pounds.

Time.	Rec. temp.	Box temp.
12.40	103.4°	67.28°
2.40	103.4°	69.71°
		2.43°

2.57 37 grains of quinine.

Time.	Rec. temp.	Cal. temp.
3.37	104.1°	68.24°
5.37	104.1°	70.7°
		2.46°

RESULTS.

Hourly dissipation of heat	148.23
Hourly production of heat	148.23
Hourly dissipation of heat	150.06
Hourly production of heat	151.01

SUMMARY.

Hourly heat dissipation before quinine	148.23
Hourly heat dissipation after quinine	150.06
Hourly gain in heat dissipation	1.83
Hourly heat production before quinine	148.23
Hourly heat production after quinine	151.01
Hourly gain in heat production	2.78

Experiment 42.—Scotch terrier; weight, 15.25 pounds.

Time.	Rec. temp.	Box temp.	Air temp.	Tube temp.
12.25	104.5°	65.66°	69.80°	68.27°
12.50	.....	.. ..	71.12°	68°
1.10	.....	.....	71.12°	68.18°
1.25	.....	.....	71.42°	68.45°
1.40	102.5°	66.92°		
		1.26°		

2 P.M. 1 gramme of quinia sulph. by mouth.

Time.	Rec. temp.	Box temp.	Air temp.	Tube temp.
3.08	103.6°	66.92°	73°	70.34°
3.30	.....	.....	72.42°	69.54°
4.05	.....	.....	70.34°	69.86°
4.23	102.8°	68.06°		
		1.14°		

RESULTS.

Hourly dissipation of heat	122.98
Hourly production of heat	104.68
Hourly dissipation of heat	111.26
Hourly production of heat	103.94

SUMMARY.

Hourly heat dissipation before quinine	122.98
Hourly heat dissipation after quinine	111.26
Loss of heat dissipation	11.72
Hourly heat production before quinine	104.68
Hourly heat production after quinine	103.94
Loss of heat production	0.74

Experiment 43.—Dog; weight, 15¼ pounds.

Time.	Rec. temp.	Box temp.
11.	103.9°	67.37°
1.	103.5°	69 08°
		1.71°

1.30 2 grammes of quinine by the mouth; 1.45, vomiting freely; 2.30, 2 grammes quinine hypodermically; 3.42, rec. temp. 103.4°.

Time.	Rec. temp.	Box temp.
3.50	103.4°	69.08°
5.20	102 4°	70.34°
		1.26°

RESULTS.

Hourly dissipation of heat	104.31
Hourly production of heat	102.123
Hourly dissipation of heat	102.48
Hourly production of heat	94.854

SUMMARY.

Heat dissipation before quinine	104.31
Heat dissipation after quinine	102.48
Loss of heat dissipation	1.83
Heat production before quinine	102.123
Heat production after quinine	94.854
Loss of heat production	7.269

Experiment 44.—Rabbit; weight, 3 pounds 7 ounces.

Time.	Rec. temp.	Box temp.
1.05	102°	66.08°
2.50	102.54°	66.48°
		0.40°

0.5 gramme of quinine sulph. by stomach.

Time.	Rec. temp.	Box temp.
3.35	101.85°	66.74°
5.20	101.85°	67.30°
		0.56°

5.25 Rectal temperature 101.85°.

RESULTS.

Hourly dissipation of heat	17.2730
Hourly production of heat	17.7238
Hourly dissipation of heat	24.1824
Hourly production of heat	24.1824

SUMMARY.

Heat dissipation before quinine	17.273
Heat dissipation after quinine	24.182
Gain of heat dissipation	6.909
Heat production before quinine	17.72
Heat production after quinine	24.1824
Gain of heat production	6.9094

Experiment 45.—Dog; weight, 33 pounds.

Time.	Rec. temp.	Cal. temp.
12.40	103°	62.12°
1.40	102.8°	63.68°
		1.56°

2. 1 gramme quinine sulphate by mouth.

Time.	Rec. temp.	Cal. temp.
2.48	102.4°	64.17°
3.48	101.8°	65.25°

RESULTS.

Hourly dissipation of heat	190.32
Hourly production of heat	185.37
Hourly dissipation of heat	131.76
Hourly production of heat	116.91

SUMMARY.

Heat dissipation before quinine	190.32
Heat dissipation of heat after quinine	131.76
Loss of heat dissipation	58.56
Heat production before quinine	185.37
Heat production after quinine	116 91
Loss of heat production	68.46

Experiment 46.—Large dog; weight, 33 pounds.

Time.	Rec. temp.	Cal. temp.
12.25	102.4°	61.52°
2.25	101.7°	64.35°
		2.83°

2.45 Gave 3.75 grms. quinine sulph. by mouth.

Time.	Rec. temp.	Cal. temp.
3.30	102.8°	64.31°
5.30	102.1°	67.51°
		3.20°

Dog vomited in the box.

RESULTS.

Hourly dissipation of bodily heat	177.63
Hourly production of bodily heat	168.97
Hourly dissipation of bodily heat	195.20
Hourly production of bodily heat	186.54

SUMMARY.

Heat dissipation before quinine	177.63
Heat dissipation after quinine	195.20
Gain of heat dissipation	17.57
Heat production before quinine	168.97
Heat production after quinine	186.54
Gain of heat production	17.57

Experiment 47.—

Time.	Rec. temp.	Cal. temp.
12.18	103.3°	61.52°
1.48	103.8°	63.14°
	111.00°	1.62°

2.10 1.5 grammes quinine by stomach.

2.35 Rec. temp. 103°.

Time.	Rec. temp.	Cal. temp.
2.45	103°	63.32°
4.15	103.3°	65.32°
		2.00°

RESULTS.

Hourly production of bodily heat	137.57
Hourly dissipation of bodily heat	131.76
Hourly production of bodily heat	164.995
Hourly dissipation of bodily heat	162.670

SUMMARY.

Heat dissipation before quinine	131.76
Heat dissipation after quinine	162.67
Gain of heat dissipation after quinine	30.91
Heat production before quinine	137.570
Heat production after quinine	164.995
Gain of heat production after quinine	27.235

Experiment 48.—Dog; weight, 17 pounds.

Time.	Rec. temp.	Cal. temp.
12.	102.2°	65.66°
1.30	101.2°	66.68°
		1.02°

1.45 7 grains quinine by mouth.

Time.	Rec. temp.	Cal. temp.
3.07	101.1°	66.80°
4.37	101.5°	68.06°
		1.26°

RESULTS.

Hourly dissipation of heat	82.96
Hourly production of heat	74.76

Hourly dissipation of heat..... 102.48
Hourly production of heat..... 107.58

SUMMARY.

Dissipation of heat before quinine..... 82.96
Dissipation of heat after quinine..... 102.48

Gain in heat dissipation after quinine..... 19.52

Heat production before quinine..... 74.76
Heat production after quinine..... 107.58

Gain in heat production after quinine..... 32.82

Experiment 49.—Rabbit; weight, 3 pounds 4 ounces.

Time.	Rec. temp.	Cal. temp.
12.25	102°	64.76°
1.55	102°	65.22°
		0.56°

2.05 About 2 grains of quinine by mouth.

Time.	Rec. temp.	Cal. temp.
3.22	101.9°	65.75°
4.52	102.3°	66.29°
		0.54°

RESULTS.

Hourly dissipation of heat..... 28.2128
Hourly production of heat..... 27.2052

Hourly dissipation of heat..... 27.1384
Hourly production of heat..... 28.1952

SUMMARY.

Hourly dissipation before quinine..... 28.2128
Hourly dissipation after quinine..... 27.1384

Loss of dissipation of heat after quinine. 1.0744

Heat production before quinine..... 27.2052
Heat production after quinine..... 28.1952

Gain in heat production after quinine.. 0.99

Drs. H. C. Wood and E. T. Reichert published in the *Journal of Physiology* a series of calorimetrical experiments. The results obtained by them in these experiments are incorporated with those arrived at in the present research in the following table. Experiments 1 to 7 inclusive are taken from the *Journal of Physiology*.

No. of experiment.	Time of each calorimetrical observation.	Weight of animal.	Drug.	Dose.	Hourly dissipation of heat.				Hourly production of heat.			
					Normal.	After drug.	Increase.	Per cent. increase.	Normal.	After drug.	Increase.	Per cent. increase.
	Hours.	Pounds.		Grains.								
1	1	17.25	Quinine sulphate.	10	108.9306	148.7805	39.8499	36	108.9306	148.7805	39.8499	36
2	1	14.25	.....	14	54.0009	98.4198	44.4189	82	73.2384	103.7635	30.5251	42
3	1	13.12	.....	13	83.1434	106.0934	22.95	27	75.2714	87.9857	12.7143	17
4	1	14.25	.....	14	70.2497	102.7485	32.49	46	80.9372	94.1985	13.2613	16
5	1¼	18	.....	15	124.718	239.4049	114.6869	92	130.5230	242.5099	111.9869	86
6	1	13.12	.....	13	77.8691	132.6034	54.7343	70	69.9941	109.9628	39 9687	57
7	1	14.25	.....	14	55.2348	94.5426	39.2078	71	64.8535	98.0694	33 2159	51
41	2	25.50	.....	37	148.23	150.06	1.83	1.5	148.23	151.01	2.78	1.84
44	1¼	3.5	.....	7.71	17.273	24.182	6.909	40	17.72	24.182	6.909	39
46	2	33	.....	57.86	177.63	195.20	17.57	10	168.97	186.54	17.57	10.4
47	1½	23.25	.....	23.145	131.76	162.67	30.91	23	137.57	164.99	27.235	19
48	1½	17	.....	7	82.96	102.48	19.52	23	74.76	107.58	32.82	45
							Average.....	43.5			Average.....	31.5

No. of experiment.	Time of each calorimetrical observation.	Weight of animal.	Drug.	Dose.	Hourly dissipation of heat.				Hourly production of heat.			
					Normal.	After drug.	Loss.	Per cent. loss.	Normal.	After drug.	Loss.	Per cent. loss.
	Hours.	Pounds.		Grains.								
40	1	25.50	Quinine sulphate.	15	269.62	193 89	75.73	28.0	281.095	195.89	85.105	30
42	1¼	15.25	.....	15.43	122.98	111.26	11.72	1.9	104.68	103 94	0.74	0.7
43	2	15.25	.....	30.868	104.31	102.48	1.83	1.82	102.123	94.854	7.269	7
45	1	33	.....	15.43	190.32	131.76	58.56	31.0	185.37	116.91	68 46	36
49	1½	3.3	.....	2	28.2128	27.1384	1.0744	3.8	27.2052	28.1952	0.99	3.7
							Average.....	13.3			Average.....	15.5

An examination of the experiments and of the tables in which they are summarized will show that the results which we have obtained by the use of quinine given are not concordant. In twelve experiments there was a decided increase in both the production and dissipation of animal heat. In two experiments both functions were decidedly lessened; in one there was a slight diminution, and in two there was no distinct effect. The discrepancies are not to be explained by the varying size of doses, because contrary results were reached with doses of practically equal proportionate size.

The difficulties which attend the administration of quinine are excessive. When given by the mouth, it is very apt to vomit the animal, and if it be used hypodermically, it produces an amount of local irritation which has an immediate effect upon the heat functions. Further, our experience has also shown that there is in the uninjured animal from hour to hour a curious and at present not altogether explicable variation in the production and dissipation of animal heat, and that in order for any drug or operative procedure to produce an apparently uniform result, it is essential that its influence be overwhelming. In the present case we can only consider that the ordinary average effect of quinine given to the normal dog in the method we have used it is to produce an increase both of production and also of dissipation of animal heat. The two functions are so connected with one another that in the normal animal they must perpetually react. Anything which increases heat dissipation primarily, secondarily will increase heat production, by virtue of the fact that whenever bodily temperature is lowered by excessive loss of heat the attempt is made to maintain the bodily temperature by an excessive production of heat. Without more light than we have upon the problem, it seems to us impossible to decide whether the heat production or the heat dissipation is the function primarily affected by quinine.

We have made a few experiments upon the action of quinine on the heat functions of animals which were under the influence of pepsin. The quinine was given after the pepsin fever had commenced, but, as it is uncertain what the undisturbed course of the fever would have been had the quinine not been given, it is very difficult to judge of the exact bearing and value of our results. For this reason we soon abandoned the method of experimenting, but the results we did achieve seem to us to accord with those obtained by a better plan.

In the following experiments the dog was first given pepsin, and after the fever had set in quinine, or else the quinine and pepsin were given simultaneously.

Experiment 50.—Dog; weight, 9 pounds.

Time.	Remarks.
11.30	Rec. temp. 102° F. Etherized; jugular exposed.
12 noon	2 grammes concentrated pepsin injected into jugular vein.
12.20	Rec. temp. 101.2° F. Dog evidently feels cold; tries hard to get to fire.

Time.	Rec. temp.	Cal. temp.
3.38	106°	60.55°
4.38	104.2°	61.7°
		1.15°

4.50 1 gramme quinine sulphate hypodermically.

Time.	Rec. temp.	Cal. temp.
5.5	104.2°	61.6°
6.5	104.2°	62.6°
		1.0°

RESULTS.

Before quinine.	Hourly dissipation of heat.....	86.905
	Hourly production of heat.....	74.75
After quinine.	Heat dissipation.....	75.57
	Heat production.....	75.57

SUMMARY.

	Heat dissipation.	Heat production.
Before quinine.....	86.905	74.75
After quinine.....	75.57	75.57

Experiment 51.—Dog; weight, 14.6 pounds.

Time.	
11.25	4 grammes of concentrated pepsin.

Time.	Rec. temp.	Cal. temp.
2.05	105.4°	61.65°
3.05	106.8°	62.42°
		0.77°

3.20 1 gramme quinine hypodermically.

Time.	Rec. temp.	Cal. temp.
3.35	106.8°	62.87°
4.35	105.6°	63.64°
		0.77°

Time.	Rec. temp.	Cal. temp.
4.52	105.6°	63.68°
5.52	103.7°	64.54°
		0.86°

RESULTS.

Before quinine.	Hourly dissipation of heat.....	93.94
	Hourly production of heat.....	109.27
After quinine.	Hourly dissipation of heat.....	93.94
	Hourly production of heat.....	82.20
	Hourly dissipation of heat.....	104.92
	Hourly production of heat.....	84.48

Experiment 52.—Dog; weight, 6½ pounds.

Time.	Rec. temp.	Cal. temp.
11.42	102.8°	62.14°
2.12	103.8°	64.55°
		2.41°

3.15 1 gramme concentrated pepsin into jugular and 0.5 gramme quinine hypodermically.

Time.	Rec. temp.	Cal. temp.
3.38	102.7°	65.33°
5.08	103.4°	66.92°
		1.59°

Time.	Rec. temp.	Cal. temp.
5.40	103.4°	67.64°
7.10	103.1°	69.03°
		1.39°

Dog killed by pithing.

RESULTS.

Hourly dissipation of heat..... 80.0975
Hourly production of heat..... 81.8038

Hourly dissipation of heat..... 72.8503
Hourly production of heat..... 73.5003

Hourly dissipation of heat..... 70.0282
Hourly production of heat..... 69.2970

Experiment 53.—Dog; weight, 26 pounds.

Time.	Rec. temp.	Cal. temp.
8.40	103.4°	63.78°
10.55	103.5°	66.30°
		2.62°

11.35 5 grammes concentrated pepsin into jugular. Injected hypodermically 1 gramme of quinine.

Time.	Rec. temp.	Cal. temp.
12.10	102.2°	65.38°
2.10	100.6°	67.12°
		1.74°

Time.	Rec. temp.	Cal. temp.
2.35	100.6°	66.92°
4.35	102.4°	68.97°

RESULTS.

Hourly dissipation of heat..... 142.0622
Hourly production of heat..... 149.154

Hourly dissipation of heat..... 106.14
Hourly production of heat..... 93.66

Hourly dissipation of heat..... 125.5
Hourly production of heat..... 139.09

An examination of these experiments, as tabulated on page 737, will show that the following comments upon them are correct. In the first, Experiment 50, the temperature of the animal had been raised by means of pepsin from 102° to 106° when the first attempt was made to measure the heat production and heat dissipation for an hour. As it turned out, the animal was just at the maximum of the fever, so that the temperature fell spontaneously nearly two degrees during the hour in which the dog was in the calorimeter. The quinine was then given, but it failed to have any effect upon the temperature, which in the subsequent hour remained constant. There was, however, a decrease in the production of animal heat so slight as to have no significance with a pronounced decrease of heat dissipation. We do not think that any conclusion can be drawn from this experiment.

In the second experiment (Experiment 51) the heat dissipation and production were first studied after the fever had been fully formed, whilst the temperature was still rising; the quinine was then given, and studies made of the thermic functions during the steady fall of temperature which followed. In both the periods examined the fall of temperature was undoubtedly the result of diminished heat production with, in the last period, marked increase of heat dissipation: if these phenomena were produced by the quinine, and were not simply spontaneous phenomena of the fever at the time when it was naturally abating, they would indicate that quinine reduces the bodily temperature by decreasing the bodily production of heat, and also increasing its dissipation. It is plain that in such case the alteration in one function is not the cause of the change of the other function, for, if it were so, diminished heat production should be accompanied by diminished heat dissipation, or else an increased heat dissipation by a decreased heat production.

In Experiment 53 the pepsin and quinine were given hypodermically, and the result was a very marked fall of the temperature, followed by a partial recovery. The fall of temperature was chiefly the result of a decreased heat production, which was only partially compensated by a parallel, but less pronounced decrease of the heat dissipation. The fall of heat production must have been primary, because it was so much larger than the lessening of heat dissipation.

It will be seen that the three experiments which we have just discussed agree in indicating that quinine in pepsin peptone fever lowers the bodily temperature by decreasing the production of animal heat. The value of the evidence may be variously estimated, but certainly the last two experiments are of some importance as evidence, although they are, of course, not sufficient to establish any theory

Experiments.	Time.	Weight.	Drug.	Temperature.	Hourly production of heat.				Hourly dissipation of heat.				Remarks.
					Normal.	After injection.	Increase.	Decrease.	Normal.	After injection.	Increase.	Decrease.	
50	3'38 to 4.38 P.M. (1 hour)	9 pounds.	pepsin 1 grm. quin. hypo. 12 M.	106° to 104.2°	86.905	.....	.....	10.335	74.75	.....	.....	.....	
	5.5 to 6.5 P.M. (1 hour)	.....	4.50 P.M.	104°	.....	75.57	.....	.....	.....	75.57	0.82	.....	Recovered; mean did not die in twenty-four hours.
51	2.05 to 3.05 P.M. (2 hours)	14.6 pounds.	4 grms. pepsin 11.25 A.M.	105.4° to 106.8°	93.94	.....	.....	.....	109.27	.....	.....	.....	
	3.35 to 4.35 P.M. (1 hour)	.....	1 grm. quin. 3.20 P.M.	106.8° to 105.6°	.....	93.94	.....	0.03	.....	82.20	.....	27.07	Recovered.
	4.52 to 5.52 P.M. (1 hour)	.....	.....	105.6° to 103.7°	.....	104.92	10.98	.....	.....	84.48	.....	24.79	
52	11.42 to 2.12 P.M. (1½ hours)	6½ pounds.	1 grm. concentrated pepsin 3.15 P.M.	102.8° to 103.2°	80.0975	.....	.....	.....	81.8038	.....	.....	.....	Killed by pithing.
	3.38 to 5.08 P.M. (1½ hours)	.....	0.5 grm. quin. hypo.	102.7° to 103.4°	.....	72.8503	.....	7.2472	.....	73.5003	.....	8.3035	
	5.40 to 7.10 P.M. (1½ hours)	.....	3.15 P.M.	103.4° to 103.1°	.....	70.0282	.....	2.8221	.....	69.2970	.....	12.5068	
53	8.40 to 10.55 A.M. (2¼ hours)	26 pounds.	5 grms. pepsin 11.35 P.M.	103.4° to 103.5°	142.062	.....	.....	.....	149.154	.....	.....	55.494	Dog used in Experiment 25. Recovered.
	12.10 to 2.10 P.M. (2 hours)	.....	1 grm. quin. 12.05 P.M.	102.2° to 106°	.....	106.14	.....	35.922	.....	93.66	.....	.....	
	2.35 to 4.35 P.M. (2 hours)	.....	.....	100.6° to 102.4°	.....	125.5	.....	16.562	.....	139.09	.....	10.064	

or generalization. After having performed these various experiments, it became plain to us that the only satisfactory method of studying the action of quinine upon peptone fever would be to produce fever in a dog by the use of pepsin in fixed amount, and, after the animal had recovered, to administer the same amount of pepsin along with quinine, and then compare the two results. Of course such experimentation is very laborious, involving two whole days for each experiment.

Experiment 54.—Dog; weight, 6½ pounds.

PART I.*

PEPSIN ALONE.

Time.	Rec. temp.	Cal. temp.
9.00	103.4°	62.88°
11.00	102.4°	64.78°
		1.90°

Time.	Rec. temp.	Cal. temp.
11.50	Injected 1 gramme of pepsin.	
12.25	102.4°	64.66°
2.25	105.4°	66.4°
		1.86°

Time.	Rec. temp.	Cal. temp.
2.50	105.4°	66.45°
4.50	103.6°	68.36°
		1.91°

RESULTS.

Hourly dissipation of heat..... 71.78
Hourly production of heat..... 69.33

Hourly dissipation of heat..... 70.2801
Hourly production of heat..... 77.57

Hourly dissipation of heat..... 72.1693
Hourly production of heat..... 67.7593

PART II.

PEPSIN AND QUININE.

Time.	Rec. temp.	Cal. temp.
11.42	102.8°	62.14°
2.12	103.2°	64.55°
		2.41

3.15 1 gramme concentrated pepsin.
3.20 0.5 gramme quinine hypodermically.

Time.	Rec. temp.	Cal. temp.
3.38	102.7°	65.33°
5.08	103.4°	66.92°
		1.59°

Time.	Rec. temp.	Cal. temp.
5.40	103.4°	67.64°
7.10	103.1°	69.03°
		1.39°

Dog killed by pithing.

* Part I. is Experiment 32.

RESULTS.

Hourly dissipation of heat..... 72.8503
Hourly production of heat..... 73.5003

Hourly dissipation of heat..... 80.0975
Hourly production of heat..... 81.8038

Hourly dissipation of heat..... 70.0282
Hourly production of heat..... 69.2970

Experiment 55.—Dog; weight, 20 pounds.

PART I.

PEPSIN ALONE.

Time.	Rec. temp.	Box temp.
11.20	102.80°	69.85°
12.20	.....	70.30°
1.20	102.70°	70.80°
	0.10°	0.95°

1.45 12 grms. of boiled pepsin into jugular.
1.50 Injection ended.

Time.	Rec. temp.	Box temp.
2.	103°	70.35°
3.	104.60°	70.85°
	0.40°	0.50°

Time.	Rec. temp.	Box temp.
3.15	104.60°	70.82°
4.15	71.70°	.....
5.15	106.60°	72.45°
	2.00°	1.63°

RESULTS.

Hourly dissipation of heat before pepsin..... 57.950
Hourly production of heat before pepsin..... 57.200

Hourly dissipation of heat after pepsin..... 61.000
Hourly production of heat after pepsin..... 69.000

Hourly dissipation of heat..... 99.430
Hourly production of heat..... 114.430

PART II.

QUININE AND PEPSIN.

Time.	Rec. temp.	Box temp.
11.	105.8°	62.30°
12.	.....	63°
1.	105.8°	63.65°
		1.35°

1.10 Injected 12 grms. boiled pepsin into jugular; also 20 grs. of the bisulphate of quinine under the skin.
1.15 Injections ended.

Time.	Rec. temp.	Box temp.
1.20	103.8°	63.50°
2.20	105.5°	64°
	1 7°	0.50°

Time.	Rec. temp.	Box temp.
2.25	105.5°	64°
3.25	.....	64.65°
4.25	102.5°	65.40°
	3°	1.40°

RESULTS.

Hourly dissipation of heat..... 82.350
Hourly production of heat..... 82.350

Hourly dissipation of heat..... 61.000
Hourly production of heat..... 86.500

Hourly dissipation of heat..... 85.400
Hourly production of heat..... 62.900

Experiment 56.—Dog; weight, 16 pounds.

PART I.

Time.	Rec. temp.	Box temp.
10.30	103°	66.20°
11.30	.....	66.50°
12.30	103.8°	66.55°
	0.8°	0.35°

12.40 12 grms. of boiled pepsin into jugular.
12.45 Injection ended.

Time.	Rec. temp.	Box temp.
1.35	103.3°	67.20°
4.35	106.5°	68.40°
	3.2°	1.20°

RESULTS.

Hourly dissipation of heat before pepsin..... 21.350
Hourly production of heat before pepsin..... 26.150

Hourly dissipation of heat after pepsin..... 48.80
Hourly production of heat after pepsin..... 61.60

PART II.

Time.	Rec. temp.	Box temp.
10.20	103.5°	58°
11.20	.....	58.70°
12.20	104.5°	59.56°
	1°	1.50°

12.35 Injected 12 grammes of boiled pepsin into jugular.
12.35 Injection ended.
12.40 Quinine bisulphate hypodermically 13 grs.

Time.	Rec. temp.	Box temp.	T. air.
1.10	105.5°	59.75°	62°
2.10	.....	.....	.....
3.10	.....	.....	.....
4.10	102.4°	62.25°	70.2°
	3.1°	2.50°	

RESULTS.

Hourly dissipation of bodily heat.. 91.500
Hourly production of heat..... 97.500

Hourly dissipation of heat..... 101.67
Hourly production of heat..... 89.27

The results of these experiments are summarized in the following two tables. The first of these tables represents the heat dissipation of the days, giving at the same time the rectal temperature for each period, and thereby enabling the examiner to see at a glance the whole matter. The second table is similarly arranged for heat production.

No. 1.—Fever Experiments with Pepsin and Quinine. Heat Dissipation.

	First day, no drug but pepsin.			Second day, quinine and pepsin.		
Exp.	Before pepsin.	First period after pepsin.	Second period after pepsin.	Before drugs.	First period after drugs.	Second period after drugs.
55	R. T. 102.8°–102.7° D. 57.950	R. T. 103°–104.6° D. 61.000	R. T. 104.6°–106.6° D. 99.430	R. T. 105.8°–105.8° D. 82.350	R. T. 103.8°–105.5° D. 61.000	R. T. 105.5°–102.5° D. 85.400
56	R. T. 103°–103.8° D. 21.350	R. T. 103.3°–106.5° D. 48.800		R. T. 103.5°–104.5° D. 91.500	R. T. 105.5°–102.4° D. 101.670	
54	R. T. 103.4°–102.4° D. 71.780	R. T. 102.4°–105.4° D. 70.2801	R. T. 105.4°–103.6° D. 72.1693	R. T. 102.8°–103.2° D. 72.8503	R. T. 102.7°–103.4° D. 80.0975	R. T. 103.4°–103.1° D. 70.0282

No. 2.—Fever Experiments with Pepsin and Quinine. Heat Production.

	First day, no drug but pepsin.			Second day, quinine and pepsin.		
Exp.	Before pepsin.	First period after pepsin.	Second period after pepsin.	Before drugs.	First period after drugs.	Second period after drugs.
55	R. T. 102.8°–102.7° P. 57.200	R. T. 103°–104.6° P. 69.000	R. T. 104.6°–106.6° P. 114.430	R. T. 105.8°–105 8° P. 82.350	R. T. 103.8°–105.5° P. 86.500	R. T. 105.5°–102.5° P. 62.900
56	R. T. 103°–103.8° P. 26.150	R. T. 103.3°–106.5° P. 61.600		R. T. 103.5°–104 5° P. 97.500	R. T. 105.5°–102.4° P. 89.270	
54	R. T. 103.4°–102.4° P. 69.33	R. T. 102.4°–105.4° P. 77.57	R. T. 105.4°–103.6° P. 67.759	R. T. 102.8°–103.2° P. 73.5003	R. T. 102.7°–103.4° P. 81.8038	R. T. 103.4°–103.1° P. 69.2970

In order to facilitate the understanding of these tables, which are necessarily somewhat complicated, we have prepared two small tables in which the final results are placed in juxtaposition for comparison. In the first table, heat dissipation is considered. The first column gives the number of the experiment; the second and third columns are devoted to the first day,—*i.e.*, the day in which pepsin was alone used; absolute increase and the percentage of increase of heat dissipation in the first and second periods after the injection of the pepsin being placed in their respective columns; or, as in the case of Experiment 2, the absolute increase and the percentage of increase in the only period studied after the injection of the pepsin is given in each column. The last two columns of the table represent the second day, in which pepsin and quinine were both administered.

A table of heat production has also been prepared for these experiments in a manner similar to that just explained.

Perhaps these tables will be most easily understood by reading one of them across. For this purpose let us take the table of heat production and read Experiment 55, as follows: The first period after the injection of the pepsin alone, the heat production as compared with that before the giving of the pepsin was increased 11.8 units per hour, or seventeen per cent. In the second calorimetrical period during the pepsin peptone fever, the production of heat was increased absolutely 57.2 units, or fifty per cent. On the second day after the simultaneous administration of pepsin and quinine the heat production, as compared with that before the administration of the drugs, was increased in the first calorimetrical period absolutely 4.15 units, or 4.5 per cent. In the second period it was diminished absolutely 20.45 units, or twenty-four per cent.

In examining these tables it will be found that in regard to heat dissipation the results are not absolutely concordant, but still agree very closely. In Experiments 55 and 56 both the amount and the percentage of heat dissipation after the use of pepsin and quinine was very distinctly less than after the administration of the pepsin alone. In the third experiment there was a slight absolute and percent-

Table of Percentages, etc., in Pepsin and Quinine Experiments. Heat Dissipation.

No. of Exp.	First day, pepsin alone.				Second day, pepsin and quinine.			
	First period after pepsin.		Second period after pepsin.		First period after pepsin and quinine.		Second period after pepsin and quinine.	
	Absolute.	Percentage.	Absolute.	Percentage.	Absolute.	Percentage.	Absolute.	Percentage.
55	+ 3.050	+ 5	+ 41.480	+ 41	— 21.350	— 26	+ 3.050	+ 3½
56	+ 27.450*	+ 56	.....	.....	+ 10.170†	+ 10	.....	.....
54	— 1.4999	— 2	+ 0.389	+ ½	+ 7.2472	+ 9	— 2.832	— 4

* Dog in calorimeter for three hours without interruption.

† Dog in calorimeter for three hours without interruption.

Table of Percentages, etc., in Pepsin and Quinine Experiments. Heat Production.

No. of Exp.	First day, pepsin alone.				Second day, pepsin and quinine.			
	First period after pepsin.		Second period after pepsin.		First period after pepsin and quinine.		Second period after pepsin and quinine.	
	Absolute.	Percentage.	Absolute.	Percentage.	Absolute.	Percentage.	Absolute.	Percentage.
55	+ 11.800	+ 17	+ 57.230	+ 50	+ 4.150	+ 4½	— 20.450	— 24
56	+ 35.450*	+ 56	.....	.....	— 8.230†	— 8½	.....	.....
54	+ 6.25	+ 8	— 1.61	— 2	+ 8.3035	+ 11	— 4.2003	— 5

* Dog in calorimeter for three hours without interruption.

† Dog in calorimeter for three hours without interruption.

age increase of heat dissipation during the first calorimetrical period after the exhibition of the pepsin and quinine as compared with the corresponding period of the pepsin day. But during the last calorimetric periods of the two days the dissipation was greatly less after the pepsin and quinine. The experiment taken as a whole agrees with the others. The three experiments therefore show that the addition of quinine to the pepsin causes a distinct lessening of the heat dissipation.

In regard to heat production the results achieved were similar to those obtained by heat dissipation. If the whole term of the experiments be considered in each of the three experiments, heat production was distinctly reduced by the quinine. In the third experiment, however, during the first calorimetric period after the pepsin and quinine, the increase of heat production was slightly greater than that which occurred in the corresponding period after the pepsin alone.

These experiments are in accord with those which we have previously detailed in regard to the action of the quinine in the pepsin peptone fever of dogs. We do not think that our results are sufficient to positively determine whether the heat production or the heat dissipation is the function which is primarily influenced.

In the large doses in which quinine was employed in these experiments it is well known to produce marked depression of the circulation. We have attempted to make experiments to determine, if possible, the relations between this depression of circulation and the effect of the quinine upon the bodily temperature of the fevered dog. In order to do this it seemed essential that the quinine should be injected directly into the venous circulation, as otherwise it would be necessary to wait for an hour or so for the absorption of the quinine with the animals connected with the kymographion, and not under the influence of any narcotics. In every experiment in which we have practised the intravenous injection the quinine has produced death in a few moments by its depressing cardiac influence, although the solution of the drug was well diluted, and thrown into the vein very slowly and with great caution. We have, therefore, been baffled in our attempt to study the relation between the actions of the drug upon thermogenesis and upon the circulation. We have not pushed this subject as far as we otherwise would have done, because we believe that it is an assured fact that there is a depression of the circulation at the period when the bodily temperature is depressed. Whether the influence of the quinine upon the temperature can be produced by doses so small as not to affect the circulation remains uncertain, and it is still more uncertain whether the influence of the quinine upon the fever temperature is or is not due to its action upon the circulation, but we are inclined to believe in the independence of the two actions.

Quinine influences the nervous system in a manner which is, at present, mysterious; leaving out of sight the question of its antimalarial effects, its power of restoring failing uterine contractions in parturition, with its lack of power in originating such contraction, is at present inexplicable. The best explanation we can at present give is, that quinine seems in some way to stimulate or support the nervous centres against certain morbific agents and certain conditions of exhaustion, and that the uterine contractions are restored by the power of the uterine nervous centres being in this way recuperated. It is possible that the influence of quinine in fever is of similar character, or, in other words, that its chief value is due to its so stimulating or restoring the normal tone of the centres, which are connected with thermogenesis, so as to enable them to resist the morbific fever-producing influences.

In coming to this as a plausible conclusion, we, of course, do not mean to assert that we have fairly established it experimentally. It is equally possible, and perhaps, to most minds, it may seem a more probable conclusion, that the influence that we have found quinine to possess over the heat functions in fever is due to a power similar to that which we shall show later in this chapter is exerted by antipyrin.

(To be continued.)

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*ON THE USE OF ARSENIC IN CERTAIN FORMS OF ANÆMIA.**

By William Osler, M.D.†

IN an address last year, Dr. Wilks remarked that in therapeutics we do not so much need new remedies as a fuller knowledge of when and how to use the old ones. I do not know a more striking illustration of this than

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is afforded by arsenic, a good old remedy, for which an almost new use has arisen in certain cases of pernicious anæmia. The attention of the profession was directed to the subject by Bramwell in 1877, and although various reports bearing witness to the value of this drug have appeared from time to time, the knowledge of its efficacy does not appear to be very wide-spread, and there are still points in connection with its employment upon which we need information. These, I trust, discussion may bring out, and render clear the direction which future observation should take.

In treating a case of anæmia, it is of the first importance to ascertain, if possible, the cause. For convenience, and until the present complex pathology is simplified, we may classify the anæmias into secondary and primary; the former induced by causes acting upon the blood itself, the latter the result of disturbance in the blood-making organs. This distinction, not always clear, serves to separate two clinical and pathological groups of cases.

The secondary anæmias are the most common, and arise from a variety of causes, as hemorrhage, prolonged drain of albuminous material in chronic disease, and the action of toxic agents in the blood. In very many of these conditions a return to the normal state follows naturally upon removal of the cause, and the regeneration of the corpuscles may take place with extraordinary rapidity, as after a copious bleeding or a sharp fever; but, as a rule, iron in some form will be found useful or indispensable. In three of these secondary anæmias I have found arsenic very beneficial.

1. *The Anæmia of Heart-Disease.* — In chronic valvular trouble we not infrequently meet with an impoverished condition of the blood, which materially aggravates the cardiac distress. The comfort of such patients is in direct proportion to their corpuscular richness, and without any apparent increase in the valve mischief, a reduction in the ratio of the corpuscles is followed by shortness of breath, palpitation, and signs of heart-failure. The value of iron in this condition is well known, and its combination with digitalis a universal practice. Arsenic is also indicated in these cases, particularly in children, or if, as sometimes happens, iron does not agree. In June of this year I saw a lad, J. W., æt. 14, who had had chronic valve-disease for four years. He had been wintering in the South, and went afterwards to the Arkansas Hot Springs. When I saw him the anæmia was very marked, and he suffered from breathlessness on the slightest exertion. There was no cardiac distress, and the compensation was not seriously disturbed. At the Hot Springs he had several chills, with fever, for which he had taken quinine. He was ordered Fowler's solution of arsenic, beginning with ♏iii, three times a day, and increasing to ♏vi, if well borne. He had been taking an iron and strychnine pill for several weeks, and had with him a boxful, which he was advised to finish. Digitalis was prescribed, but was not to be taken unless there were signs of heart-failure. The diet was carefully regulated. The lad improved rapidly, and within six weeks had a good color, and had gained several pounds in weight. He had not needed the digitalis. The arsenic was well borne. The improvement had continued on the 3d of this month. Possibly here there was a malarial taint; but, in any case, if medicinal agents had anything to do with the rapid improvement, the credit is due to the Fowler's solution.

2. *In Malarial Anæmia.*—The value of arsenic in chronic ague-poisoning is so well recognized that I need scarcely detain you with the narration of cases in support. There have been several at my clinic during the past year in which the improvement in the blood condition, as tested by the hæmacytometer, has been very remarkable. One case in particular, from Cape May, I may refer to, as the patient, with enlarged spleen, had on two occasions hemorrhage from the stomach. The arsenic in this case was pushed for several months in increasing doses. At one time he took ♏xxxvi of the Fowler's solution daily. When last heard from, in July, he was at work, and had gained in flesh and strength. On May 12, the date of the last blood count, the percentage was over eighty (it had been scarcely fifty), and the spleen had diminished materially in volume. In certain of these cases the ratio of the corpuscles may increase rapidly without any essential change in the volume of the spleen. In the case of M. D., a girl of 15, who has been in the University Hospital on several occasions for the past two years, the arsenic, which was very persistently employed, does not appear to have reduced the spleen in the slightest degree, and yet under its use the corpuscles rose to eighty-five per cent. In this instance, with a history of malaria, there is evidence also of congenital syphilis, to which may possibly be due the splenic enlargement. Injections of arsenic

into the substance of the organ were tried without benefit.

3. *Certain Anæmias of Gastric Origin.*—As a tonic in debilitated states of the stomach, arsenic has long been a favorite remedy with many practitioners. It is sometimes also of great service in the anæmia of chronic gastric catarrh, particularly in alcoholic patients. A good illustration of this was under my care at the Philadelphia Hospital this spring. W. G., aged 25; waiter; hard drinker; history of dyspepsia for several years. Admitted April 5 with anæmia and attacks of giddiness. Ill for ten days; vomiting, pain in stomach, and fainting spells on attempting to stand. Had been failing in strength for some time and getting pale. Had suffered from palpitation, and said he had vomited blood. He was profoundly anæmic, and could not stand without danger of fainting. Tongue coated; great irritability of stomach; vomiting on the slightest provocation; great throbbing of abdominal aorta. He was kept at rest, given a milk diet, and Fowler's solution in 3-drop doses. The red corpuscles were not more than twenty-five per cent., and the coloring matter about the same. The improvement was rapid, and by the 21st the corpuscles had risen to over forty per cent., and the gastric irritation had almost disappeared. The arsenic was well borne, and was gradually increased to ♏vii t. i. d., and on May 4 he was ordered small doses of nitromuriatic acid. On May 17 he left the hospital with a fair digestion and, for him, tolerably good color. On June 24, when readmitted with extensive pleuro-pneumonia, he stated that he had recovered strength rapidly, and had been at work. Possibly, in this case, there was ulceration of the stomach in addition to the chronic catarrh; but, whatever the condition, it was one in which the arsenic seemed to be highly beneficial, and, as he received no other medication, we may reasonably attribute to it the stimulation of the blood-making function. As we shall see, there are anæmias of gastric origin in which this drug is powerless. These are some of the secondary anæmias which have, in my experience, been apparently benefited by the use of arsenic.

Turning now to the primary group, we have here again for convenience to make a division of the cases. There is, first, a large section of what may be called cytogenic anæmias, in which the reduction and alteration in the corpuscles is associated with evident changes in the hæmatogenous tissues,—the spleen, lymph-glands, and bone marrow. Sometimes these changes are accompanied by an increase in the colorless corpuscles of the blood; and, depending on the organ involved, we then speak of splenic, lymphatic, or medullary leukæmia. If there is no marked increase in the white corpuscles we call the cases splenic anæmia, lymphatic anæmia (Hodgkin's disease), and medullary anæmia. The pronounced leucocytosis in certain of the cases, which gives a special character to the blood, is probably not such an important factor as we have hitherto supposed, and there are such insensible gradations between the cases that in a strict classification they may be appropriately grouped together. Secondly, there is the curious primary anæmia known as chlorosis, characterized by well-marked etiological and anatomical peculiarities; and, thirdly, we have the much-discussed affection, pernicious or essential anæmia.

The anæmias of this primary group offer a remarkable therapeutic study, embracing cases of the most hopeful and the most hopeless character. A clearer knowledge of the etiology and pathology of certain of these forms may give a clue to lines of treatment more fortunate than those we now possess; for, if we except chlorosis, the majority of the cases of this class of anæmias prove fatal. Leukæmia, splenic anæmia, when non-malarial, Hodgkin's disease, are considered incurable affections, and very many of the cases of pernicious anæmia prove obstinate to all treatment.

The relation of arsenic, as a remedy, to this group of primary anæmias is worthy of our closest study, more particularly as of late years remarkable results have been reported from its use. Chlorosis may here be excluded from our consideration, as it would only be in a strangely obstinate case that a practitioner would require to employ arsenic. The specific action of iron in increasing the defective hæmoglobin of the corpuscles, and doubtless, also, in stimulating the formation of new ones, is one of the few instances in therapeutics in which definite tissue-changes, under the influence of a drug, may be followed with scientific accuracy from day to day and from week to week.

In *leukæmia* and *Hodgkin's disease* arsenic has been extensively tried, occasionally with temporary success. We must bear in mind in these affections that there are natural periods of improvement without any special medication. I have met with this in leukæmia, and it must be taken into account in our estimation of the effect of a remedy. Person-

ally, I have not seen any benefit from the use of arsenic in this disease. It was given in several of the eleven cases which I saw in Montreal, all of which were fatal. In Hodgkin's disease the report is more favorable. In 1883 I had two cases, both in women, in which the large glands of the neck and armpits reduced materially under the prolonged use of Fowler's solution, but I do not know the subsequent history of the cases. Several writers have reported most satisfactory results. Karewski* had three recoveries, and of eleven cases treated at the Stockholm Hospital five were benefited.† The persistent use of it in full doses for many months is probably the most efficacious remedy we possess in this disease.

In cases of *splenic anæmia* of non-malarial origin, I cannot say that I have seen any special benefit from arsenic.

We come now to *pernicious anæmia*, in which so much has been gained by the judicious use of this drug. Pernicious anæmia includes cases of very diverse etiology. Any severe anæmia tending to a fatal termination may well be termed progressive and pernicious. In a considerable proportion pregnancy and parturition appear to have been determining factors, while others can be directly traced to defective food, as in many of the Zurich and Bern observations. Excluding these, we have a group of cases of which the etiology is obscure, and to which, in our present knowledge, the terms *idiopathic* of Addision and *essential* of Lebert are applicable. Every year, however, we are reducing the number of cases which we can strictly call idiopathic. It is reasonable to suppose that the extensive changes in the bone marrow found in certain instances are directly related to the profound disturbance in blood formation, just as is the case in hyperplasia of the spleen or of the lymph-glands. An anæmia medullaris is now very generally recognized. Then, there are the cases of pernicious anæmia in which the primary disturbance seems to be in the gastro-intestinal canal, and the condition of the blood the direct consequence of the impaired nutrition. There remain cases in which none of these conditions prevail, and neither during life nor after death do we find any clue to the origin of the anæmia. To such, for the time, the designation idiopathic is applicable. Clinically, it may be impossible to distinguish between these various forms, and the etiology is often very obscure and gives us no help. The cases which come on during or after pregnancy, or which result from inanition, are readily recognized, and offer, as a rule, a more hopeful prognosis; but we cannot yet with any accuracy separate during life the cases in which there is atrophy of the mucous membrane of the stomach, or extensive medullary changes, from those in which these conditions are absent. A more careful study may in the future enable us to do so, and I have laid stress upon these differences in etiology and pathology because in them will possibly be found the explanation of the success or failure of certain remedies.

Prior to 1877 arsenic was not systematically employed in pernicious anæmia, and to Bramwell is undoubtedly due the credit of its introduction. Neither Müller‡ nor Eichorst,§ in their elaborate monographs published in 1877 and 1878, speak of its use. Padley,‖ in an interesting review of the question, has carefully analyzed the cases in which arsenic was not employed, and finds that of forty-eight, forty-two were fatal, while of twenty-two cases treated with arsenic sixteen recovered, two improved, and four proved fatal; and he remarks, that "in the whole list there is not, with one exception, a single authentic case of recovery in which arsenic did not form the chief part of the treatment." Certainly the reports of this affection since 1880 have been much more encouraging, and it need not necessarily be regarded as "almost invariably fatal," to use the words of a leading textbook. Of three cases of pernicious anæmia which I have seen this year two have already proved fatal, and one is in a fair way to recovery.

Case I.—A man, aged 42, I saw with Dr. Henry. We reported it in full in the April number of the *American Journal of Medical Sciences*, and it is remarkable as an instance of pernicious anæmia, with advanced atrophy of the mucous membrane of the stomach. Arsenic was given during the course of the disease, but not for any length of time, as it seemed to bring on diarrhœa.

Case II.—A woman, aged about 45, I saw with Dr. Weir Mitchell on January 20. She had been the subject of dyspeptic attacks for some years, and had become very pale, and during last year the anæmia reached an extreme degree. With rest, systematic feed-

* *Berliner Klin. Wochenschrift*, 1884, 17 and 18.

† Abstract in Year Book of Treatment for 1884.

‡ De Progressive Perniciose Anæmie. Zurich, 1877.

§ De Progressive Perniciose Anæmie. Leipzig, 1878.

‖ *Lancet*, 1883, ii.

ing, iron, and arsenic she improved, and was able to go home and attend to her household duties. I saw her in January on her way South. She returned in March very much worse; was again placed on the plan of treatment which had proved so successful in the first attack, but the stomach was so irritable and the digestive power so enfeebled that she sank, and died on the 18th of April. The improvement in her first attack was attributed by Dr. Mitchell to the careful feeding and rest as much as to the medicine.

Case III.—An active business man, aged 43; seen March 4. History of dyspepsia, and for the past six months failure in strength. Shortness of breath on the slightest exertion, and at times attacks of agonizing pain at the heart resembling angina. He had not lost much flesh; indeed, as is usual in these cases, the subcutaneous fat was well developed. When first seen, the anæmia was marked; lips and tongue very pale, and sclerotics pearly. The general surface did not look so pale, on account of his dark color and a decided saffron-yellow, sub-icteroid tint of the skin. The temperature was a little elevated; pulse 100, and of moderate volume. With the exception of heart-murmur, there were no symptoms elicited in the examination of thoracic and abdominal viscera. The blood showed in a marked manner the corpuscular changes of advanced anæmia. The blood count could not be made at the time, but when I next saw him, two weeks later, there were only 700,000 red corpuscles to the cubic millimetre, and the color percentage was only about twenty. He was put to bed, absolute rest, given a milk diet, ordered massage once a day, and as medicines bismuth and carbonate of sodium, with Fowler's solution ♏v, three times a day, to be increased one minim daily at the end of a week. He had been taking, by the advice of his physician, an elixir of iron and strychnine, which was continued. For two months there was not much apparent change, though the ratio of the colored corpuscles increased to over 1,500,000 per cubic millimetre. The arsenic had been pushed to 15 drops three times a day, when puffiness of the eyelids and forehead came on, and it was omitted for a week, and started again with ♏v. On reaching ♏xiii a slight red rash appeared, and it was stopped, and, after beginning at ♏v again, he reached ♏xx t. i. d. On these large doses he seemed to improve more rapidly, and he bore them for two weeks or more, when gastric irritation supervened, with diarrhœa. The drug was then stopped for ten days, and pills of $\frac{1}{100}$ of a grain of arsenious acid ordered. On January 31 he was allowed to get up. By June 13 he was able to move to Cape May. The blood condition has rapidly improved, and at the last count the corpuscles were nearly 4,000,000 to the cubic millimetre. When seen on September 7 he looked remarkably vigorous, had a good appetite, was at business, and feeling very well. It would be incorrect to attribute the success in this case entirely to the arsenic, but rather to the plan of treatment, in which it was a very important factor. It will be found, I think, that absolute rest in bed, with daily massage, and the strictest attention to feeding, are most important features in the successful management of these cases.

Arsenic has been spoken of as a specific in pernicious anæmia. This is a mistake. The disease, as I have indicated, is so varied, and results from the operation of such diverse causes, that we cannot expect any one remedy to be uniformly active. In a majority of the cases iron is useless, but it sometimes succeeds after arsenic has failed absolutely. Such a case was reported by Finlay* last year, which was cured by iron after a thorough and but ineffectual use of arsenic. I do not think we understand fully the conditions in which it is most serviceable, and for the time we must be content to employ it empirically, on faith of the success which has attended its administration in so many cases. Ultimately, we may hope to be able to discriminate between the cases which call for iron and those in which arsenic is indicated, and with this object in view the cases which come under observation should be carefully studied.

Mode of Administration.—I usually give the liquor arsenicalis (liquor potassii arsenitis), beginning, in an adult, with ♏v three times a day. Occasionally this is found too much, and I reduce the amount to 2 or 3 minims. After ten days, if well borne, I order an increase of a minim each day, so that by the end of the second week the patient is taking 10 or 12 minims three times a day. This is kept up for a week, and then gradually increased until the physiological effects are obtained. The amount which will induce these varies with different individuals, and those who bear it best seem to improve the most rapidly. I have thought sometimes that the small doses are not so well borne as larger

* *Lancet*, 1885, i.

ones, and are more likely to cause gastric irritation. Young people bear it remarkably well. Within the physiological effects there is no special limit to the quantity, and, as in chorea, I make them my guide in the administration. A very important point is the continuous use for many weeks or months, omitting for a few days if unpleasant effects arise. Even after apparent recovery I advise the continuance of the drug. When the liquor arsenicalis is not well borne, the arsenious acid in pills may be tried, or the solution may be given hypodermically. In these cases of severe anæmia I never care to use hypodermic injections systematically, as I have seen ecchymosis of the tissues follow, and in several instances distressing small abscesses. By the rectum, it is usually well borne.

The three points I would indicate for this are,—

1. In what secondary anæmia is arsenic beneficial, and under what conditions is it preferable to iron?

2. In pernicious anæmia what cases are benefited by arsenic? What by iron? How shall we frame rules for our guidance in the matter, or must we still work empirically?

3. In the administration of arsenic, what is the best form and method?

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*THE SALTS OF MANGANESE IN FUNCTIONAL DISORDERS OF MENSTRUATION.**

By J. L. Watkins, M.D., Nashville, Tenn.

WHEN the Committee on Essays appointed me to read a paper on the "Therapeutic Uses of Permanganate of Potassium," I had little idea of the magnitude of such an undertaking, and went vigorously to work collecting such data as I had access to, and at the same time instituting some experiments to ascertain and establish in my own mind the location of permanganate of potassium as an antiseptic, disinfectant, etc. As the work progressed, its results, whether valuable or not, grew to such proportions that it was clearly impracticable to undertake a presentation of the whole subject before you in one evening. I determined accordingly to ask your attention to only one of the many claims it has upon us as a valuable therapeutic agent, that of its use as a regulator of the menstrual function. Nor can I undertake a very extended consideration of the manner in which it acts, as the most of my time shall be consumed in reporting cases upon which I have tried it.

Remembering how much has been written in the last three years upon this subject, and how favorable, in the main, have been the reports, I have been surprised to find, upon inquiry, how few of the physicians in this city use it; how few, indeed, know of its action as an emmenagogue.

It was in the early part of 1883, I think, that I saw Ringer and Murrell's article on the subject in the London *Lancet*. I determined at once to make a thorough trial of the remedy, and unscientifically to make it a routine treatment until I could satisfy myself as to its merits. Up to the 1st of August last I had used it in nineteen cases, of which I make the following report, giving them in the order in which they occur in my note-book.

Case I.—One of the most striking in its results I have met with was in Mary A., Jefferson Street, a thin, consumptive-looking mulatto girl, 17 years old, who had never menstruated, who gave a history of tubercular heritage, but the disease had not actively developed itself up to the time I saw her in August, 1883. I treated her vigorously with cod-liver oil, hypophosphites, iron, exercise, etc., and while her general health and physique were greatly improved, up to January, 1884, four months later, she had failed to menstruate. My first opportunity was here presented to try the remedy for which Ringer had claimed so much. Accordingly, I ordered the permanganate in gr. ii, t. i. d., with no other directions. The next day I was summoned hastily by her mother to know if I had poisoned her daughter, so great was the distress after taking each pill. This frightened and discouraged me somewhat, but I wrote for a dozen pills composed of gr. ii ext. hyoscym. and gr. ¼ ext. opii each, one to be taken a half-hour before each permanganate pill, and urged my patient to persevere in the use of the medicine at all hazards. She was enabled by the last prescription to better tolerate the permanganate, but still suffered from the characteristic effects of the drug,—viz., substernal pain, distressing nausea, vomiting, and griping. She stoically kept this up for ten days, at the end of which time a slight, pale flow was observed, but lasted only one day. The remedy was discontinued the next day for nearly three weeks, and then renewed. After struggling

* Read before the Nashville Academy of Medicine, September 30, 1886.

with its bad effects for eight days, she was rewarded with a menstrual flow of no mean proportions, lasting three days. The next period the remedy was left off, and no flow appeared; it was tried again the succeeding month with satisfactory results.

Since this time she has menstruated occasionally, frequently missing, however, but refuses to take the permanganate on account of the disturbance it occasions, and because the absence of the flow does not inconvenience her as much as the medicine does.

Case II.—Occurred about the same time, in January, 1884, in Ella B., an octaroon, unmarried, aged 20 years, with perfect physical development and excellent previous health. Had just passed a third period without menstruating; said it made her sick, and she wanted relief. I ordered permanganate of potassium, 2 grains in solution, to be taken every four hours; but she could not stand the disgusting taste, and, after the second dose, a change was made to 2 grains in pill form every four hours. My patient was admonished that she was taking a strong medicine, and that its effects would be as disagreeable as its taste. Two days afterwards, being called to see her, I found a copious flow was in progress, but accompanied by severe bearing-down pains. She had suffered for more than an hour after each dose with the most violent pains in the stomach, behind the sternum, and in the occipital region; with nausea, vomiting, sickening eructations, and great prostration. Thinking she had only dysmenorrhœa, which would be corrected by a continuance of the remedy, I insisted that she should not leave it off, and took my departure. Early the next morning I answered a hasty summons to see her, the messenger saying "something had happened." I was thunderstruck upon entering the room to be shown a well-developed three months' fœtus and placenta, which had passed a short time before, and to find the girl flooding dangerously!

I did not know as much about the race as experience has since taught me, and never suspecting pregnancy, as she was unmarried, had innocently, or rather through negligence, I fear, produced an abortion, the very thing the wretch desired. I had been caught in the trap she laid for me, but said nothing about it, stopped the hemorrhage, and left.

Dr. Ringer says permanganate of potassium will not produce abortion; but it certainly did so in this case. Whether it acted as a direct oxytocic, or whether the miscarriage was brought about indirectly by the violence of the heaving and vomiting and the extreme prostration, I am not prepared to say.

Case III.—Mrs. W. J. R., Church Street, aged 25 years; married three years; had only one child, which was nearly two years old. Consulted me in February, 1884, for cessation of menstruation. She was small, but round and plump, with good color. Always had good health, with the exception of occasional dysmenorrhœa or menorrhagia, accompanied by distressing headache. Like the child in the saying, I had been burned once (in the last case), and was afraid of the fire (in this one). Here was a young married woman who had weaned her child six months before, why might she not be pregnant also? My fears were soon put at rest, however. She knew she had not been "caught," as she expressed it, this time, because she had been in Louisville, away from her husband, for nearly three months, nursing her sick mother and father, the latter having just died. She had menstruated twice during the first month of her absence, and had seen nothing since; which irregularity was manifestly due to the close confinement, loss of rest, worry, anxiety, etc., incident to nursing sick and dying parents. She had just returned home two days before, and her sickness was then due, causing dragging pains in the pelvis, nervousness, vertigo, and headache. I gave her 2 grains of the permanganate three times a day after meals. The drug caused her no discomfort whatever, and she began menstruating after the fourth dose, her sickness continuing three days. In February, 1885, she consulted me for the same trouble, and was treated in the same way with equal success. Also in December, 1885, with like results. She moved to Chicago a few months since, and three weeks ago I had a letter from her asking for the same prescription, saying the change of climate had not agreed with her, and she had not menstruated since going there. I prescribed the permanganate, but have not heard from her since. In this case the remedy was remarkably prompt in its action, and caused no gastric disturbance.

Case IV.—March, 1884. Mrs. George C., Jefferson Street, aged 37, married, but had not lived with her husband for nearly a year, he being off in another county at work. Had never borne any children; was a hard-working woman, but poorly fed; had not been perfectly regular since her marriage, and had not been sick now for four months; suffered with slight difficulty of urination, habitual constipation,

frequent and severe pelvic pains, pain in the back and left hip. She took the permanganate capsules, 2 grains each, three times a day. They produced no effect beyond that of great gastric disturbance, and were discontinued in ten days. The treatment was begun again a week before the next period, but fell short of the desired effect, as it did also the two months following. I promised her to change the treatment the next month, but she never returned. I made no examination of the patient, and cannot say precisely what was the cause of the amenorrhœa.

CASE V.—In August, 1884, attended Mrs. Lizzie K., Church Street, aged 31 years. Had been a widow two years; was the mother of two children, the younger 7 years old; had missed last two months without apparent cause, her health being very fair with the exception of an annoying nervous cough, for which I had prescribed several times without success. Two-grain capsules of the permanganate were administered three times a day, causing the usual gastric distress, but giving negative results as far as menstruation was concerned. They were discontinued in six days, but renewed four days before the next period was expected. Normal menstruation came on in due time, and she has continued regular since. The cough disappeared with the return of the menses.

CASE VI.—In July, 1884, was one of metrorrhagia in a German girl, Annie F., 19 years old. Extreme plethora was combined with a large development of the lymphatic temperament in this case. The complexion was muddy, and her puffy face disfigured by an abundant eruption of *acne pustulosa*. She was chambermaid in a German hotel, and had a good deal of scrubbing and other hard work to do. She had suffered with metrorrhagia for five months, her sickness appearing with irregularity every two or three weeks, and lasting from seven to ten days. This weakened her and rendered her so utterly miserable that work became intolerable, if not almost impossible, and she was crying nearly all the time. Wishing to give the permanganate a fair trial in this case, I prescribed it alone and sent her to the country. She returned in two days saying she could not take the medicine, it made her so sick. I imagined the extr. of hyoscyamus alone would lessen its disagreeable effects, and so ordered 2 grains of it, to be taken a half-hour before the permanganate capsules. The result was not what I hoped for, but enabled her to bear the capsules a little better. She returned from the country to her work in six weeks, her general health much improved, and a decidedly satisfactory improvement in the amount of her flow. She had left off the hyoscyamus in four days, but had kept up the permanganate throughout the month, her sickness not appearing until twenty-four days after the cessation of the last flow, and continuing only five days.

I saw her three weeks afterwards. She was still taking the permanganate notwithstanding its disagreeable effects, and the intermediate flow had not appeared up to that time, a few days from the next period. I have never seen her since.

CASE VII.—August, 1884, Matilda H., aged 20, of German parentage, living in the country, healthy, industrious, and fond of her flowers. She got her feet wet while working in the garden, causing sudden suppression of her menses, which had just begun upon her. She was suffering so intensely with pelvic pains, headache, cold extremities, and short, rapid breathing, that I gave her a hypodermic injection of morphine and atropine. Ordered potassii permanganas, gr. ii, t. i. d. The flow reappeared satisfactorily after the fourth capsule had been taken, but the remedy was continued another day.

CASE VIII.—Mary B., single, aged 19, German cook. Her father's home in East Nashville was burned on the night of February 2, 1885. She was aroused from sleep, ran out into the cold night air without more protection in the way of clothing than she had worn in bed. The sudden exposure to cold, and the severe shock and fright she had endured, caused a suppression of her menstruation, which was then in the second day of its progress. I called to see her on the morning of the third at a friend's house, found her with a most agonizing headache, uterine pains, and chilly sensations. I ordered for her permanganate of potassium in 2-grain capsules, to be followed by two tumblers of water each time, and to be taken after meals. They gave her very little trouble, causing only a sense of fulness in the stomach, and during the next night her sickness reappeared, and lasted two days.

She consulted me in June of the same year, having gone two days over her time, with no other signs of menstruation than those of dizziness and backache. She brought with her the same box of capsules she had taken before, and asked if she must take them again. I found six of them left, and directed her to take them as she did before. Five of them

caused the menses to return, but gave her more pain in the stomach than at first.

CASE IX.—Fanny R., Hayes Street, 17 years old. Came here from the country in January, 1885, to attend school. Was tall, thin, rawboned, anæmic, with frequent swelling of the ankles, and hysterical, bordering on insomnia. Indifferent to her studies, but devoured novels with passion, and lived all the while in a morbid atmosphere of romance, dreaming and sighing. She had not menstruated in February and March, and was anxious about herself. I saw her in April, and at my first visit prescribed a pill of valerianate of zinc, belladonna, nux vomica, aloes, and iron, and 2-grain capsules of binoxide of manganese, each to be given three times daily. She reported at my office, three weeks later, improved in general health, had better color, was not so nervous, and slept well, but no menses had appeared. I told her to keep up the tonic pills, but changed from the binoxide to the permanganate, to be begun four or five days before the next period. This change, made without reason, cost me my patient, as she sent for me two days after she began taking the permanganate, complaining bitterly of its distressing effects upon the stomach. As I had neglected before to tell her to take it after meals, and to follow it with large draughts of water, I gave her those directions, and promised to return the day following, after assuring her she would have no more trouble. The next day she sent word that I need not come out. I suppose she had found the permanganate, with its vigorous manifestations, decidedly too unromantic for her, and had fled to the ideal realms of unreal infinitesimals. Indeed, I heard as much afterwards.

CASE X.—Mollie H., age 22, sister of Case VII., consulted me in June, 1885. Had not menstruated in two months; was to be married in September, and wanted to be all right by that time. She was of a decidedly bilious temperament and sluggish in her movements, had no appetite, was anæmic and restless at night, had frequently suffered with dysmenorrhœa. She was hired out as housegirl, and did a great deal of hard work for a large family. Put her on the 2-grain permanganate dose, to be followed by large draughts of water. This made her so sick she had to quit work and go to bed, but discontinued the medicine after the fifth dose. I accordingly changed to the binoxide of manganese in 3-grain doses before each meal. She tolerated this very well, and kept it up through July and August. Although the general health was improved, the menses failed to put in an appearance in July, but they came on in August, also in September, during which month she married and I lost sight of her.

CASE XI.—July, 1885. A simple case of suppressed menstruation in Matilda L., a German girl, 20 years old, caused by taking a cold bath while sick. The function was restored by a few doses of permanganate capsules, followed by large draughts of water, and no unpleasant effects from the drug.

CASE XII.—July, 1885. Mrs. John M., Gallatin Pike, 32 years old; a small, frail woman. Had never menstruated or borne children during the ten years of her married life. Suffered almost constantly with pain in the back, pelvis, and left hip; had no discharge of any kind. Thought if she could have her menses restored she would have better health. She would not permit an examination, so I had to strike out in the dark, and prescribed the binoxide in 2-grain doses three times a day. After continuing this five weeks ineffectually, she took the capsules every four hours with no better result. I then added a tonic treatment, and changed to the permanganate in 2-grain capsules after each meal with copious draughts of water. This was taken two months, was well borne, but accomplished nothing in the way of establishing menstruation. In the mean time the lady had taken on flesh, and was much improved in general health. I could not induce her to continue or to undertake another line of treatment.

CASE XIII.—Mrs. Jenny B., Hillsboro' Pike, about 38 years of age; highly nervous temperament, small, wiry figure; had been a widow several years. Was called to see her on the night of February 2, 1886; found her suffering with an aggravated form of hysteria. Had been nursing her sick father-in-law several weeks, and, on account of the loss of sleep, irregularity of habits, anxiety, etc., had passed over her last period without menstruating, and had been more or less hysterical ever since. I administered to her immediate wants that night, and told her to let me know a week before her next period was expected. On the 15th of the same month she sent for me, saying she was due on the 20th. Permanganate capsules in 2-grain doses after each meal, followed by a tumbler or two of water, were ordered. She came to my office March 1 to say the remedy had acted promptly, and had not given her the trouble I had caused her to anticipate.

CASE XIV.—February, 1886, Jennie H., laundry-girl, 21 years old, was like Cases VII. and XI., one of suppressed menstruation from exposure to cold, and was treated successfully in the same way.

CASE XV.—In February, 1886, I was called to see Amanda L., a colored girl, 24 years old, who two days before had taken on her own responsibility a nickel's worth of calomel for biliousness. How much she got I do not know, but she had to endure for the next six weeks the most horrible tortures of mercurial salivation, which passing off under treatment, left her in a most pitiable condition of anæmia and vital depression, with metrorrhagia which had lasted more or less throughout the period of the salivation, but which had escaped my notice, not having had my attention called to it. Her stomach was so weak and irritable still that I was afraid of the permanganate, but put her upon the binoxide to see what effect it would have upon the too abundant flow. Four-grain capsules three times a day were ordered, and at the same time the stomach treated by appropriate remedies. I had the gratification in three weeks of seeing her well and at work again. The excessive flow had been stopped some days before, and normal menstruation came on at the next period and continued only four days.

CASE XVI.—Frances J. was brought to me by her mother in April, 1886, with the following history: She was now 18 years old, of large physique, lymphatic temperament; had been in excellent health up to her fourteenth year, since which time she has had almost constantly a dull headache, and regularly every four weeks has had epileptic convulsions, foaming at the mouth, biting her tongue, and remaining unconscious several minutes. These convulsions, always short in duration, came on at frequent intervals for three or four days, and then passed off to reappear at the next menstrual period. As she had never menstruated, the epilepsy may be easily accounted for. I put her upon the Brown-Séquard treatment for the epilepsy, and made an attempt to remove its cause by establishing menstruation with the permanganate first and the binoxide afterwards, beginning in each case grain ii t. i. d., and running up to grain iii every four hours in the former, and grain iv every four hours in the latter. They made no impression whatever except upon the stomach, but were comparatively well tolerated. The headache entirely disappeared under the treatment, and the paroxysms were much milder but still continued. The manganese was continued until July, when they went to the country to remain all summer. I stopped it, as a thorough trial had proven it valueless in this case. Her mother would not permit an examination, she said, until other treatments had been exhausted. She returned a few weeks since in pretty much the same condition, except that there is a growing intellectual debility. She has consented for a thorough examination, which I suspect will reveal cause for more radical treatment than she has had.

CASES XVII. AND XVIII.—Two sisters, Mary H. and Sarah H. They are 17 and 19 years old; both have been chlorotic for some months, and have always been "irregular." They are large, fleshy, sluggish in their movements, and are at the same time extremely nervous. I have had them under observation over three months; the older one, though not yet well, has become less chlorotic, stronger, and more active, and the last two periods have been normal. The younger, though not so markedly chlorotic at first as her sister, has not improved in any respect. Both had the usual permanganate capsules.

CASE XIX.—Dora G., a Hungarian, unmarried, 20 years old, came under my notice August 29 for another trouble, but told me then she had suffered for some months with too much sickness. She moved here, in November last, from New York, to live with a sister; but having more friends in New York, and pleasanter occupations and diversions there, she soon grew homesick, peevish, and fretful; lost interest in everything here, and pined for friends and associations there, and lapsed from a state of menstrual regularity into a metrorrhagia. Each period would last seven days, and then there would be an interval of seven days before the next came on. One week on and one week off we might say. This had continued with unbroken regularity for nearly nine months. Dr. Jacobi, of New York, had treated her for the same condition three years ago with tinct. ferri chloridi, I judge, as she said it was a red liquid in a small glass-stoppered bottle, to be taken through a tube. This cured her in a short time, and would have done so again I suppose; but I wished to try the manganese treatment, and accordingly put her on the binoxide, grain ii, in capsules, after each meal. Her last sickness passed off on the 1st, she then looked for a rest until the 8th, when she expected it to begin again and last until the 15th. She began the binoxide on the 2d and is still

taking it. It produced no gastric irritation, but a slight catching pain behind the sternum occurring after each dose. She was in my office on the 21st of this month, and reported no flow since the 1st, the first time in nine months that she had passed two consecutive weeks without menstruating.

The first criticism you have to make is that I have thrown aside all reason and discretion in not selecting my cases, and the proper remedy for each case. I plead guilty, but claim method in my madness. As I stated in the beginning of the paper, I made it a routine treatment from the first, regardless of indications, that I might be enabled finally to judge what class of cases it was suited to, and what would do better under other forms of treatment.

We have seen from Case II. that it possesses more or less oxytocic effect, whether direct or indirect, and should therefore be given cautiously to married women suffering with amenorrhœa.

Now let us straighten out this mass of empiricism and see what else we can glean of value from it. And to the better accomplish this, I shall undertake to answer from my experience with the above cases the eight questions propounded by Dr. Billington, in *The Record*, in his superb paper on this subject.

"1. Is the permanganate of potassium an efficient emmenagogue in certain forms of amenorrhœa?" Of the nineteen cases reported, one was a pregnancy, three were cases of excessive menstruation; of the fifteen remaining cases, five were unsuccessful, leaving nearly sixty-five per cent. of successful cases. Of those where the remedy failed, in at least three of them—Cases IV., XII., and XVI.—there was evidently some organic disease of the menstrual apparatus; this reduces the cases of functional amenorrhœa to twelve, ten of which, over eighty per cent., were successfully treated. For no other single emmenagogue is so great a percentage of successes claimed. Indeed, no other remedy recommended for this condition, with the exception possibly of iron, is so far-reaching in its therapeutic effects, and none reach out in so many different directions to do the work, as do the salts of manganese. I therefore answer in the affirmative.

"2. To what forms is it applicable?" Only to functional amenorrhœa, as contrasted with that produced by organic morbid conditions of the genital organs. It certainly cannot supply a missing uterus or ovaries, nor has it been yet proven to stimulate to normal growth those organs when in a rudimentary state, or when they have become atrophied from any cause. Nor is it claimed for the remedy that it can puncture an imperforate hymen, straighten out the canal of an anteflexed or retroflexed womb, dilate a pinhole os, channel out an atresia of the vagina or uterus, or exert a curative influence upon inflammatory conditions of any of the pelvic organs, or upon ovarian cystic degeneration.

It is in menstrual disorders caused by abnormal states of the blood and the sympathetic nervous system that we claim for it sovereign power. Under the former we find it of value in anæmia, chlorosis, plethora, and even phthisis; and while I have never prescribed it in such cases, I think, on account of its tonic and invigorating effect, we might reasonably hope for some benefit in amenorrhœa from cirrhosis, Bright's disease, etc.

In those cases in which there is a decrease of nervous excitability and activity, an atonic condition of the ganglionic nervous system from emotional causes, mental depression, overwork, indolence, and luxury, want of fresh air and exercise, and occasionally from constitutional disease, it is the remedy *par excellence*.

"3. Is it also remedial to certain forms of dysmenorrhœa, menorrhagia, and metrorrhagia?" It will be seen how well the remedy acted in Cases VI., XV., and XIX., which were functional metrorrhagia; and it was equally efficient in the cases of dysmenorrhœa mentioned.

"4. To which of its component elements is this action due?" and, "5. What is the nature of this action?" I do not believe its remedial effects, in the cases recited, due entirely or principally to either the manganese or the potassium, but rather to the oxygen contained in composition. Drs. Ringer and Murrell claim that it is due to the manganese, but other observers, prominent among whom is Dr. Fordyce Barker, have shown that the chlorate of potassium, an oxidizing agent, is nearly if not quite as effectual. Dr. Broadbent has shown the same thing in respect to the chloride of potassium. On the other hand, it is certainly not due to the potassium, because the permanganate of sodium and the binoxide of manganese accomplish the same results. I am thoroughly in accord with Roberts Bartholow that oxygen is, in the main, the remedial factor. Look at its formula, $KMnO_4$, an unstable compound readily decomposing, evolving seven-eighths of its oxygen, particularly

in the presence of moderate warmth and an acid, both of which conditions we have present in the stomach; hydrochloric and lactic acids with an internal temperature, especially during digestion, of something over 100° F. It is well known that this oxygen in its nascent state contains much ozone. The permanganate of sodium ($NaMnO_4$), the binoxide of manganese (MnO_2), and chlorate of potassium ($KClO_3$), all containing a large proportion of oxygen held in yielding bonds, and therefore used by chemists as active oxidizing agents, undergo the same character of decomposition in the stomach, yielding almost as great a proportion of ozonized oxygen. This agent has a tonic and invigorating effect upon the central and ganglionic nervous systems. It is mildly stimulant to the entire organism and promotive of activity of all functions, the sexual function included. It produces a feeling of exhilaration and well-being, promotes digestion and assimilation, and therefore conduces to constructive metamorphosis, both by improving the quality of the blood and toning up the nervous system, thus proving of benefit in anæmia and chlorosis. Even those who hold that manganese is the component element of importance in menstrual disorders, grant that permanganate of potassium acts somewhat quicker and more readily, and in smaller doses, than any of the other salts, an acknowledgment in favor of the oxygen theory, because, while the manganese remains the same in all of them, the permanganate contains the greater proportion of oxygen than the others and parts with it more readily.

It is objected that this property of the drug of so easily giving up its oxygen to organic matter, in the stomach as elsewhere, renders it practically useless. I am not sure but that this very property is an advantage, for the simple reason that while the oxygen is quickly liberated, the processes of oxidation are all slow, and the stomach has ample time to take up a large proportion of oxygen, which is rapidly diffused into the blood. Again, the salt is very soluble, and, as well as chlorate of potassium, is so diffusible that not a small quantity of it is taken up, as such, by the blood before deoxidation has been completed.

Now, on the other hand, I do not deny that a certain, though small amount of this action, is due to the manganese. It also is an agent favoring constructive metamorphosis, being of the same chemical group as iron, nickel, etc., all of which exercise more or less influence either upon the sexual centres or the sexual organs themselves. The result of Case II. is significant in this connection.

"6. Does the permanganate of potassium, or manganese in any form, improve the blood condition in anæmia or chlorosis?" From what has just been said such seems clearly to be the case, and such is the consensus of opinion as the result of experience with other observers; Ringer and Murrell being the only ones I call to mind now who dissent from this opinion. They say "the permanganate not infrequently brings on the period without in any way improving the anæmia." True, but I believe this to be the case simply because menstruation, in the cases referred to, was brought on quickly and the remedy discontinued; whereas anæmia and chlorosis both require prolonged treatment. They argue, too, that the treatment cannot be of benefit in anæmia because it succeeds equally well in plethora. I ask, would either of these gentlemen deny a patient iron to assist in stopping a hemorrhage because it is a blood-making agent; or deny a patient calomel in bilious diarrhœa because it produces bilious evacuations?

"7. Is the binoxide of manganese an efficient therapeutic agent?" A question scarcely necessary to ask, so convincing are the evidences and reports that such is the case; and that it is almost, if not quite, as valuable as the permanganate in functional menstrual disorders.

"8. What are the best modes of administering the salts of manganese?" Kaolin, cerate of petroleum, cocoa-butter, and other excipients have been recommended as suitable bases for pills; but, besides the liability to explosion, slow decomposition, etc., I object to its being given in pill form because of its local irritant action when it is held at one point in the stomach, as must be the case in the excipients mentioned. They dissolve slowly, and set up so much irritation at the point of the stomach at which they happen to be located as to cause griping pains, nausea, etc. Compressed tablets are objectionable for the same reason. It will be seen from my cases that after trying several methods I finally resorted to giving it pulverized and in capsules, followed immediately by one or two tumblers of water, preferably not cold. If this is done, the gelatin-capsules dissolve off quickly, leaving the salt free, having nothing to confine it to a limited space, to disperse itself over a considerable portion of the stomach; and being pulverized, and followed by a large quantity of water, it is dissolved rapidly, and

not concentrated enough to produce any distress at all in the majority of cases. Few of my cases treated in this way had any trouble. If, however, this method should be followed by much pain, I do not see any objection to the temporary use of hyoscyamus or small doses of a denarcotized preparation of opium to establish a tolerance. The binoxide may be given in capsules, and occasions very little disturbance. Two grains of the permanganate three times a day, and 2 to 4 grains of the binoxide from three times a day to every four hours, is about the proper dose. It is only necessary to begin with the permanganate six or seven days before each period, but the binoxide may be continued throughout the entire month for several months. Its value might be greatly enhanced by using it in conjunction with other remedies appropriately selected, though the tendency seems to be to give it alone. It is best borne when given about an hour after meals.

Why do we have so many failures reported? Several causes are apparent. The remedy is often abandoned too early, either because the proper precautions have not been taken to prevent its bad effects upon the stomach, the patient refusing to take it long, or because having tried it through one period without success, it is left off and some more familiar agent or remedy resorted to. My convictions are that if its use was persevered in the number of failures would be largely reduced. Then too many, whether wittingly or not, are guilty of the same grave fault with which I charged myself in the beginning, that of making a routine practice of its administration, not exercising sufficient intelligence and care in choosing their cases. They disregard diagnosis, and make no discrimination whatever between functional menstrual disorders and those caused by organic changes or diseases; and then because they necessarily often fail, lay the burden of their own ignorance or indolence upon a remedy which deserves better treatment. Finally, the treatment is not a specific for menstrual disorders; but, while I do not pin my faith indissolubly to it, I must say with Thomas that "permanganate of potassium is the best emmenagogue yet discovered."

14 South Cherry Street, Nashville, Tenn.

HYOSCINE AS A HYPNOTIC.

By W. D. Hamaker, M.D., Meadville, Pa.

IT may be of interest to publish the marked effect of hyoscine in the following case. The patient is a clergyman, 57 years old, who for several years, owing to intense mental application, has been troubled at times with insomnia, which has been worse in the spring and early summer after the hard winter's work, and before he takes his summer vacation. Very often for weeks at a time he has been unable to fall asleep until four or five o'clock in the morning, and then only for a short time.

Ordinary hypnotics have been unavailing in producing sleep, a grain of morphine at one time and *seventy* grains of chloral at another time having failed to do any good.

The insomnia was followed later by headaches and loss of appetite and general loss of tone.

Previous to the administration of hyoscine he had suffered for several weeks from most distressing insomnia, and violent headaches from the loss of sleep.

Knowing the ineffectiveness of the ordinary hypnotics, I prescribed a solution of hyoscine hydrobromate, containing $\frac{1}{112}$ gr. to the teaspoonful. I give the patient's own account of its effects:

"*June* 14.—Sat in complete repose for an hour, reading. Respiration 18; pulse, sitting, 70; standing, 76. Pulse irregular, contracted, and very easily compressible. Pupils natural; no headache; no inclination to sleep.

"At 11.30 P.M. took $\frac{1}{112}$ gr. hyoscine in solution.

"At 12.15 respirations 16; pulse, sitting, 67; standing, 72. Pupils *slightly* dilated; no interference with accommodation; no peculiar sensations or feelings noticeable. Fell asleep at 2.30 and slept till 8 A.M. Awoke refreshed; pupils natural; no headache.

"*June* 15.—Respirations 19, and pulse, sitting, 80.

"At 11.15 P.M. took $\frac{1}{75}$ gr. hyoscine.

"At 12 M. respiration 16; pulse 70; pupils very slightly dilated. Fell asleep at 1 A.M.; slept till 7.30; no unpleasant effects; no headache; feel much better on account of refreshing sleep.

"*June* 16.—Respirations 18; pulse 82.

"At 11.30 P.M. took $\frac{1}{56}$ gr. hyoscine.

"At 12.30 respiration 14; pulse 61. Pulse irregular and very feeble; pupils very slightly dilated; slept five and one-half hours.

"*June* 17.—Respirations 18; pulse 80.

"At 11.15 took $\frac{1}{60}$ gr. hyoscine.

"At 12.15 respirations 15; pulse 70; slept six hours."

At another time the patient took $\frac{1}{60}$ gr., when respirations fell to 13 and pulse to 58. Pulse became very irregular and weak.

The solution of hyoscine used had been made several months previously, and had been kept in the light. Attention was called to this, when the patient obtained a fresh solution of the same strength ($\frac{1}{112}$ gr. to teaspoonful). He took one night two teaspoonfuls ($\frac{1}{60}$ gr.), and in a short time respiration became very slow and the pulse fluttering, and finally scarcely perceptible.

After this the dose was maintained at $\frac{1}{112}$ gr., and always had the desired effect. The question arose whether the solution of hyoscine deteriorates by long standing or by exposure to light.

In this case, then, the effect of hyoscine was,—

1. To affect respiration, reducing the number of respirations from three to six per minute in a short time. A source of error lies in the fact that the patient counted the respirations himself, but uniformly there was diminution.

2. To cause slowing of the pulse-rate at every administration, and to weaken the force of the pulse.

3. To produce or *allow* natural sleep. The sleep was always refreshing, and without any after-effects of the drug whatever.

4. To cause sleep, but not to cause "drowsiness" previous to the induction of sleep.

5. In overdose ($\frac{1}{60}$ gr.) to produce alarming disturbance of the heart's action. At one time the patient feared absolute failure of the heart after taking $\frac{1}{60}$ gr. of the new preparation.

6. Entire relief of headache which had been so distressing.

7. Improvement in general health, following, of course, the natural sleep obtained every night.

The patient continues at present to take $\frac{1}{112}$ gr. at bedtime with happy effects. The benefit in this case was more noticeable on account of the utter failure of ordinary hypnotics.

A friend of mine, some weeks ago, prescribed $\frac{1}{100}$ gr. hyoscine for a young lady suffering from phthisis. It produced violent delirium. Afterwards $\frac{1}{200}$ gr. produced sleep, and was attended by no bad effects.

The dose of hyoscine, as indicated by these two cases, should always be small at first, and gradually increased as it is required or is well borne. I remember to have given to a patient in the University Hospital $\frac{1}{60}$ gr. hypodermically. He was suffering from delirium tremens, and his heart was very weak. He slept several hours, and showed no bad effects. This I should regard as a dangerous dose until smaller doses had been tried.

THE TOXIC EFFECTS OF TEA.

By James Davies, A.M., M.D., Canaseraga, Allegany Co., N. Y.

THE perusal of Dr. Thos. J. Mays's paper on "Tea and its Alkaloid, Theine," has induced me to ask of you space for a few remarks from the Druidic faculty, which, in my opinion, may set matters right between Dr. Mays and Drs. Bullard and Morton, or, at least, help to do so. The Druids have thoroughly investigated the subject of tea by the tests of experimental physiology as well as those of chemistry. I will be as brief as I can.

1. Theine and caffeine are not identical.

2. There is such a thing as chronic tea-poisoning, and, in the main, Dr. Bullard is right, as far as the reflections on the consumption of tea by the public are concerned.

3. Dr. Morton is perfectly right in concluding that the continued and immoderate use of tea led to headache, vertigo, ringing in the ears, tremulousness, nervousness, exhaustion of mind and body, with disinclination to mental and physical exertion, increased and irregular action of the heart, dyspepsia, diminution of the amount of urine and urea, and retardation of the metamorphosis of tissue.

4. These symptoms ensue from the use of the infusion of tea.

5. Sleeplessness should have been added to the list.

6. The consumption of three grains of theine per day, or even of five, would not cause the above symptoms.

7. The consumption of tea containing so much theine—that is, the partaking of it according to the usual manner of the common people—would tend to produce the aforesaid symptoms.

8. The great subject is the consumption of the infusion of tea-leaves, but Dr. Mays's subject is another thing altogether, namely, the administration of theine.

9. The tea-tasters, as well as our tea epicures, principally get hot water and theine from the infusion; but the public would consider that product a most unsatisfactory thing.

10. Tea contains boheic acid and tannin, as well as theine and an essential oil.

11. The common people must wait for the tannin to draw before the infusion is worth the drinking.

12. What are the physiological effects of tannin on the human stomach, and especially those resulting from the persistent use? I need not rehearse them to the medical readers of the GAZETTE; but I would ask them to compare them with above symptoms.

13. The physiological effects of tannin, as handed down to us by the Druidic College of the twelfth century, are identical, as far as they go, with those reported in our modern medical and pharmaceutical works; but I would add that the old Druids further considered tannin the most potent of all the products of nature in producing *sterility* and *barrenness;* and tea-drinking, as practised by the public, undoubtedly acts in the same direction.

RESORCIN IN ECZEMA.

BY H. P. CHACE, M.D., HIGHLAND FALLS, N. Y.

I WISH to call the attention of your readers to the use of resorcin in eczema. In the April number of the GAZETTE I saw a report from Dr. Wyss, taken from the *Fortschritt*, of his use of this remedy. I had at that time upon my list two cases of general eczema that had defied the whole range of eczema remedies. One case was about six months' standing and the other four months'. Both persons had been subject to this disease for years, at times. One of my patients having had it several years ago continuously for fifteen months was seen by two New York City specialists, and finally went to Europe and consulted the famous Erasmus Wilson. I go into this detail to show that the case was of the obstinate type. The attack for which I was attending him had lasted about four months. The eruption extended over every part of his body, except from the knees down. The scrotum was swollen to three times its natural size; the face and eyes swollen very much, and, as may be imagined, the itching and burning was intolerable.

My other case was but a repetition of the one I have described, except that the eruption completely covered the body at times, and would then get a little better in some places, but in a short time returning with renewed force.

After reading the article referred to, I immediately ordered from my druggist the following:

℞ Resorcin, ʒii;
Glycerin, q.s. ℥ii. M.

Sig.—Apply with camel's-hair pencil morning and evening.

I had very little faith that my patients would receive any benefit from it, but, to my great surprise, the remedy worked like magic. Improvement was marked in forty-eight hours, and in one week both of my patients were attending to business, and are both at this writing perfectly well. Since then I have had sent me one other case of general eczema, and six cases that were localized, the remedy proving just as efficacious in every instance except one. In one case the lady could not follow my directions about keeping her hands out of water. In this case the hands are very much better, but not yet entirely healed.

I see in a report from the Dermatological Society, Dr. Stelwagon, of Philadelphia, claims resorcin is rarely of benefit in this disease. I cannot help but feel that the doctor has not given it a thorough trial, and believe, if used properly, it will prove a blessing to both patient and physician.

A LIPOMA REMOVED BY ICHTHYOL.

BY JOSEPH SCHMIDT, M.D., BERLIN, GERMANY.

IN connection with the papers on ichthyol appearing in the June and July issues of the THERAPEUTIC GAZETTE, I beg to communicate to the profession the therapeutic effects obtained with ichthyol in a case of lipoma.

The following embodies the salient points of the clinical history of the case:

Uso von Berg, a medical student from Dorpat, aged 26, presented himself for treatment for some trivial gastric disturbance. While treating this gentleman my attention was directed to an ungainly lipoma of the size of a pigeon's egg, situated on the left side of the neck over the carotid artery. Inquiry elicited that the patient had had this tumor for the last eight years, and that no signs of any change in its size had presented themselves. He also admitted that he was very anxious to

get rid of the unsightly swelling, and that he had in vain used applications of the so-called interstitial absorbents, such as iodine and mercury. The proximity of the tumor to the great artery had always been regarded, both by himself and by the physicians of Dorpat, as a sufficient cause to interdict any surgical interference with the neoplasm.

I asked the patient whether he had ever heard of ichthyol and of its unrivalled absorbing power. Ichthyol was used in Dorpat, he answered, in the treatment of eczema, but he had never heard that the drug possessed absorbing qualities. I then told the patient that I had seen veritably astounding results in more than thirty cases from the application of ichthyol in infiltrations of the cellular tissues or of joints, and that I would like to try the new remedy on his lipoma. The patient readily consented, though candidly admitting his incredulity regarding any curative results.

I applied the fifty per cent. solution of the ichthyosulphate of ammonium (obtained from Cordes, Hermanni & Co., Hamburg) three times daily for ten successive days by thoroughly rubbing the drug into the part. As in all external applications of ichthyol, I washed the part previously with lukewarm soap-water, so as to open the pores of the epidermis and favor the absorption of the drug.

Sharing, as I did, the incredulity of my patient concerning the benefit to be derived from this novel treatment of a fatty tumor, the results obtained ultimately were naturally all the more surprising. On the first, second, and third days no alteration, either in size or consistency of the tumor, could be discovered, and physician and patient came wellnigh abandoning what appeared an utterly hopeless medication, when, on the fourth and fifth days, careful measurement and palpation revealed a distinct decrease in size and appreciable softening of the swelling. Stimulated by this promising improvement, the treatment was continued for six more days, each successive day marking a further decrease in size and a greater softening of the part. On the ninth day of the treatment the tumor had grown so soft that a fluctuation could be distinctly made out, and the size of the lipoma had so materially decreased that this fact was noted with surprise by friends of the patient wholly unaware of the treatment. On the same day a yellowish-white spot suddenly appeared on the top of the tumor, which rapidly expanded into a zone marked by great pliability and thinness. It was then clear to me that I stood before a singular pathological process: that the thin yellow zone was evidently a suppuration focus, and that the drug had transformed a fatty tumor into a simple abscess about to open spontaneously.

I consequently withdrew the ichthyol applications, and treated the tumor as an ordinary abscess, *i.e.*, facilitated its impending spontaneous opening by the aid of the bistoury. My surprise, however, cannot be imagined when, scarcely having touched the part with the knife, a sero-purulent whitish mass gushed vehemently from the tumor, squirting over the room and clothing of both operator and patient. I then pressed the still remaining liquid with my fingers out of the abscess, extracted with the forceps the base and sides of the capsule of the former lipoma, and dressed the part with ichthyol adhesive plaster. On the twelfth day, after the plaster was removed, the part was found to have completely healed, and not the slightest trace of a swelling was left.

Shortly after the unique issue of the treatment of this case, I told Dr. Unna about it, who asked for the privilege to publish the case in his *Monatshefte für Dermatologie.*

In view of the above unprecedented result obtained with ichthyol in a case of lipoma, it would be very desirable to give the drug further trials in the direction indicated. The hope to cure by mere external medicinal applications what heretofore was only possible by the *ultimo ratio* of the knife, ought to prove a powerful stimulant for further trials.

USE OF BLACK HAW IN HABITUAL ABORTION AND OTHER UTERINE TROUBLES.

By Cheves Bevill, M.D., Winfield, Ark.

IN 1878 my attention was called to the haw in a paper published in *New Remedies*, page 105, April, 1878. I first employed it in the case of a lady who had aborted three times. It was used from the third to the fifth month with her with good effect, and she went to full term, and since has borne two children without any inconvenience.

Besides this case I have employed the haw in sixteen cases of threatening abortion that I have notes of, besides seven others of which I have no record. Six of these patients had aborted from two to four times. In five of them the child was carried to full term. In one abortion occurred, but I do not think the drug was kept up long enough to have the desired effect.

Three of the sixteen had aborted once, and they all went to full term, and did well.

Of the remaining three cases noted of primiparæ two aborted, and I feel sure that too much time had been lost before they let it be known, and the membranes were broken.

In half of these cases I did not have the fluid extract of the haw, and had to make a decoction of the bark of the root, which I think is best. In giving the fluid extract I give from 30 to 60 drops from two to four hours apart, till all pains cease.

In congestive as well as obstructive dysmenorrhœa, I find it very beneficial, increasing the flow in the obstructive form,—*i.e.*, obstruction from clots and shreds plugging up the canal.

In after-pains it has acted well with me, causing the patient to rest well.

By its quieting effect on the contracted uterus at the menstrual epoch, black haw allows the flow to go on without causing the patient to suffer as much as she would without it; and, if given in sufficient quantities, I believe it will prevent abortion in almost every case where the placenta is not detached or the membranes broken. It has never, in my hands, affected the stomach enough to produce nausea.

ANALGESICS.

At the meeting of the Section in Therapeutics of the British Medical Association, the debate on analgesics was introduced by Dr. Spender, in a paper rather too long for such a purpose, but full of interest (*Medical Record*, September 4, 1886). After some introduction, he said we come to close quarters with pain in neuralgia, calculus in the ureter, gall-stones, gout, etc., and patients demand relief at all cost. In such cases opium, or its alkaloid, still remained our chief agent. In supra-orbital pain, however, it was of little use, while 10 grains of quinine, followed by a few doses of 5 grains, would cure. Gelsemium or chloral were not to be compared in these cases, especially when, as usually, there is a touch of malaria present. Again, in night-pain in a syphilitic patient, analgesics of such a kind give only temporary relief, while iodides will, after a few doses, permanently remove the suffering. So salicin and arsenic are relatively indirect analgesics in other cases. Iron, in myalgia and neuralgia, has a similar relative value. Bromides only dispose to sleep, and in slight pain appear analgesic; but if the pain is sharp enough to baffle sleep, it defies bromides. They bring the system into a placid state disposing to sleep, but if this is disturbed the analgesic charm is broken. He referred to doses, and illustrated the subject by the different effect in various quantities of tartar emetic, of opium, and morphine. Bleeding relieved vascular tension. Ergot raised motor force, and possibly sensation. He next urged that we economize our power by combining drugs, instancing morphine given with bromides, aconite with quinine, hemlock with several others, quinine with arsenic in herpes zoster, or with colchicum in gout, etc. He thought that, as surgeons have their instruments all in place, so as to find just what they want, so physicians should have a cupboard where all their analgesics could be seen in order at a glance, with hypodermic syringes and other means of employing them. He concluded with a recognition of physical analgesics, and the importance of recognizing not only the mental influence which by the sight of the dentist dismisses toothache, but the spiritual comfort which the presence of a wise, Christian physician may insensibly impart.

The President thanked Dr. Spender, and asked Dr. Brown-Séquard to follow.

Dr. Brown-Séquard then gave an account of his discovery that a jet of carbonic acid gas, or of the vapor of chloroform, projected forcibly on the larynx, produced anæsthesia. Other agents will do it, but these are the best. After the larynx is thus anæsthetized the influence extends to other parts, and he has rendered animals insensitive to pain all over by this method. The effect lasts a long time,—twenty-four or even thirty-six hours,—and that without the least effect on consciousness or interference with any other function. He considered it due to an effect on the superior laryngeal nerve. When this nerve was divided, on one side there was no anæsthesia at all. He divided both and scarcely any effect occurred on either,—only just enough to be attributed to the other less important nerves.

The higher the scale of the animal, the greater the effect. He had tried to apply it to man and had succeeded on himself, but the effect of projecting CO_2 on the laryngeal membrane is so exceedingly disagreeable, he had found no one else able to endure it for a long enough time, and, of course, precautions must be taken to prevent its inhalation. He was still, therefore, searching for an agent suitable for use on mankind. Galvanism of the nerve sometimes acted in the same way, but was very uncertain, and therefore useless.

The Therapeutic Gazette

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Leading Articles.

REFLECTIONS ON THE PROPER USE OF INSANE ASYLUMS.

THE asylum with its various appurtenances for the treatment and protection of the insane is one of the greatest boons which modern scientific humanitarianism has conferred upon a suffering race. It is, however, possible for even a great gift to be abused through misunderstanding. We have sometimes thought that the asylum has become in the minds of many practitioners of medicine a sort of fetish, a mysterious something which has peculiar and inexplicable effects upon disordered intellects, so that any insane person who has not had the opportunity of shelter and treatment within the asylum, has, in the estimation of the physician, been deprived of his rights. On the other hand, among many of the laity, a sort of stigma attaches to the insane asylum, so that when a person is sent to an institution a sense of disgrace is felt by the whole family. This is, of course, utterly wrong, although it rests upon a very natural feeling. Insanity is such a dreadful thing and is so strongly hereditary, that every person shudders at the thought of its being in his or her family. The sending of a person to an asylum is a public admission of insanity, which involves to some extent not only the unfortunate individual but also the immediate relatives and descendants. It may even interfere with the life prospects of the young of either sex, hindering the one in the obtaining of responsible positions, the other in the securing of marriage. Further, the going to an asylum often involves an increase of mental suffering, especially when the insanity takes the form of a mild melancholia. Whilst, therefore, the superintendents of asylums often complain that patients are sent to them too late, it seems to us that it is possible to err on the other side, and to send patients unnecessarily to an institution. This is especially true when there are abundant pecuniary means at hand.

Insane asylums are chiefly useful as a means of saving expense. Very few remedial measures are instituted within an institution which cannot be as well carried out away from the asylums. A raving maniac can be controlled as thoroughly in a private house as in the wards of an asylum. A melancholic can be diverted and soothed as readily in a country mansion as in a country madhouse. Very frequently it is essential for the insane person to be removed from his old surroundings and to be put under new influences, but such new surroundings and new influences can be readily found away from asylums. There are cases, it is true, in which the discipline of the institution seems to have an effect, the disordered intellect yielding to the influence of numbers about him, but even this influence can be obtained in small private retreats. The asylums exist, and are justified because by their means insane patients can be treated at a comparatively small cost. In various of our recent exchanges we have read articles claiming that the insane could be treated at their homes, and so written as to give the impression that their authors thought they had made a discovery!

When there is the power of obtaining first-class medical care, abundant nursing, isolation, and proper hygienic surroundings, in the majority of instances we believe that even better results can be obtained outside than inside of an institute, but no physician ought to undertake the treatment of a severe case of insanity unless he is thoroughly assured that the necessities can be commanded.

In the case of the chronically or hopelessly insane, the question as to the use or non-use of the asylum frequently requires very careful consideration. The sane as well as the insane have rights, and a mild lunatic in a

family may make the existence of a large number of persons so miserable that souls in purgatory would not change places with them. Under such circumstances, unless the afflicted individual has enough means to take care of himself away from his family, or rather to be taken care of away from his family, he should be sent to the asylum. Again, there is a class of monomaniacs, or partially insane persons, who simply cannot be controlled unless in confinement, or unless legal authority be given some one to enforce obedience. It is these cases especially which come into court, and are not rarely let loose upon themselves and upon a much-suffering community. We never heard of such a thing being done, but we cannot see why, in such cases, power could not be given to a suitable person to take charge of the half-insane individual, and by means of attendants control all his acts. Probably an alteration of the laws would be necessary in order to give the court such power, except in the case of those lunatics who have committed some crime. According to our understanding of the law of Pennsylvania a court may, in the case of a person acquitted of a crime on the ground of insanity, release him, after a longer or shorter sojourn in an asylum, upon bonds for good conduct given by some relative, and we suppose the person who gives bonds has authority over the one who is bonded.

THE DIURETIC ACTION OF MERCURY.

IN several of our previous issues we have referred to the interesting results obtained by Jendrassik and Stiller through the employment of calomel as a diuretic in cases of heart-disease. These authors, however, have been unable to explain the manner in which mercury produces its diuretic effect, but, as pointed out by Mr. F. S. Locke in the *Practitioner*, September, 1886, the recent work of Noel-Paton on the connection between bile-secretion and the formation of urea seems to have furnished the required clue. Noel-Paton has found that there is a direct relation between the activity of drugs as hepatic stimulants and their activity in causing increased formation and secretion of the most important nitrogenous waste products. Drugs, therefore, which cause an increased formation of bile also give an increased formation of urea, and give support to the fact generally held by physiologists, that the liver is the great seat of the formation of urea. Rutherford has proved that mercuric salts cause an increased production of urea through the destruction of the red blood-corpuscles. As is well known, an increased quantity of urea in the blood acts as a powerful diuretic, and we there have a plausible explanation as to the manner in which calomel acts as a diuretic. If we acknowledge the fact that calomel is a hepatic stimulant, which, by the way, is denied by Rutherford, and can believe that all hepatic stimuli are increasers in the production of urea, we have thus the chain of argument completed as to the way in which calomel may be of use in heart-disease. The evident break in this train of argument is the contradiction as to the action of calomel on the liver. Mr. Locke, who agrees with the statement of Rutherford as to the fact that calomel is not a hepatic stimulant, thinks that the specimens used by Jendrassik and Stiller contained a trace of the per-salt, or that calomel is to a slight extent decomposed in the alimentary canal, the formation of the per-salt thus being suggested in order to explain the great cholagogue effect of the drug.

FURTHER NOTES ON THE YELLOWSTONE REGION.

IN the editorial which we published last month concerning the possibilities of the Northwest as a sanitarium, we recommended that a chemist be appointed by the United States Geological Survey to make a thorough chemical study of the waters of the Yellowstone Park. In our recent visit to the Yellowstone Park we found no chemist present, and took it for granted that this portion of the work had been overlooked, but we are informed that Professor Gooch was for a long while stationed in the Park with a proper chemical outfit, and that afterwards he supplemented his work on the ground by studies of residuums at Washington. As the thermal springs of the Yellowstone are to be numbered by the thousands, an absolutely complete analysis of them is almost impossible, but it is stated that the work of Prof. Gooch has been very wide-spread. The reputation of the professor guarantees that the analyses, so far as they go, are thorough and reliable, and we look forward with much expectation to the forthcoming volume.

The law does not permit the opening of new boarding-houses, or even the location of private dwellings within the Park, except under a special agreement with the government, and at present there is much complaint

that a large stock company has practically a monopoly of the keeping of hotels and the furnishing of transportation in the Park. Without the granting of peculiar rights, it is not probable that any individual or corporation would have undertaken the task of developing the resources of the Park or of properly providing for visitors, but when such rights have been given, the United States officials should certainly see that proper sanitarian and other arrangements are made for the reception and treatment of the sick at reasonable rates. Only the rich can afford the prices at present charged in the Park hotels, but the people of the United States will finally assert their rights to the curative powers of this great thermal region.

UNNA'S PLASTER MULLS.

THE name of Unna has within the last five years or so become familiar not only to those engaged particularly in dermatological practice, but also to the general practitioner. The readers of the GAZETTE are aware that the profession owes quite a number of important therapeutic innovations to Unna. Among these we mention the keratinized pill, the knowledge of the medicinal virtues of ichthyol, the paste pencils, the oily medicinal soaps, and last but not least the medicated mulls. The name of plaster mull has been given to a dressing consisting of a very thin sheet of gutta-percha, coated on one side with an adhesive substance containing one or more medicinal compounds, and backed on the other side with mull or undressed muslin. The name of salve mull also has been given to a similar kind of dressing, in which the medicaments are of a more soothing character, consisting of ointments having a basis of suet and lard, spread upon mull.

The local application of strong salicylic acid "plaster mulls" is strongly recommended by Unna in the treatment of lupus. In experimenting with a strong salicylic acid plaster mull to remove the cuticle and prepare lupoid tissue for other more destructive agents, Dr. Unna observed that salicylic acid itself exercises a most beneficial influence upon the new growth. The chief drawback is the great and lasting pain caused by salicylic acid when applied to a thin epidermis or raw surface. In order to overcome this various combinations were tried; cocaine failed to give relief, while opium and cannabis indica required an hour or two to develop their anodyne effects. The best results were obtained when genuine beechwood creasote was combined with salicylic acid in the proportion of two parts of creasote to one of acid. Even then there is a painful stage lasting from ten to fifteen minutes, but a previous application of cocaine is sufficiently lasting in its effects to cover this period. The salicylic acid plaster mulls used by Dr. Unna were of five different strengths, containing respectively 10, 20, 30, 40, and 50 grammes of salicylic acid, and 20, 30, 40, and 50 grammes of creasote to each strip.

FAIR PLAY.

IN an exchange which has hitherto had the reputation of being a respectable journal, we notice a bitter editorial attack upon the journals whose publishers are in any way connected with drug houses. It is intimated that such journals are run for the purpose of bolstering up certain preparations, and are therefore unworthy of support from the profession. We have doubted somewhat the propriety of noticing such attacks as these, but as the THERAPEUTIC GAZETTE is the most prominent of such journals printed in the English language, and as the unwary may occasionally be misled, a few words are allowable.

The competition in medical journalism in the United States is so great that there is very little money to be made out of it. Indeed, we believe that most of the American journals either do not pay their editors at all, or pay them very insufficiently for the labor, or else are published at an actual loss. When a medical man is proprietor and editor of a journal, he takes what he gets out of it, and if a few hundred dollars results from his year's labor, claims that his journal is on a paying basis. A publishing house, if it desire the services of successful physicians as editors, must pay commensurate salaries, and thereby increase the expenses of the journal. Each of the large medical publishing houses in the United States has its own journal, which is of value to it partly as a direct method of advertisement, but more largely for its indirect influence. To be known as the publisher of a widely-circulated journal is to have a direct road to the notice of the medical profession. It is just as allowable for those who provide drugs as for those who provide books to open such a medium of communication with the profession. The advertisement columns of American medical journals are commonly under the control of the publisher of the journal. The book purveyor uses these columns for his

books, the drug purveyor for his drugs. The text of a journal is under the control of the editors, and whoever the publisher of the journal may be, the character of the text depends upon the ability and the independence of the editors. False book notices may appear in the columns of one journal, just as false accounts of preparations or drugs may be published in another journal. The reader ought to judge a medical periodical partly by the known character of its editors, but more largely by the results of his own perusal of its contents. It is especially in the latter way that the editors of the THERAPEUTIC GAZETTE desire its readers to judge of it. If a review of its columns since it came under the present management shows that these columns are free from articles especially devoted to the interests of its publishers, and are open and fair-minded in their criticisms and in their praises, then those journals whose failing circulation and general feebleness betray them into the bad habit of deriding their more successful rivals ought to be eschewed. The editors of this journal believe they have at times acted even unfairly in excluding articles whose bearing might be misrepresented, and have always in this been upheld by the publisher. The charlatanism and effrontery of the attack which we have just noticed is well shown by the following extract from the editorial in question, in which others are upbraided for praising their own wares, and a whining plea made for patronage, in asserting "the remedy consists in buying books from firms which make publishing their only business, and who are above the suspicion of catering to the interests of any advertising dodge."

ON TELEOTHERAPEUTICS.

THERE is no reason why in this age of the telegraph, the telephone, and the telescope, our old and venerable therapeutical science should not conform to the leading spirit of the day, and introduce a perfectly seasonable teleotherapeutical departure. We have all the respect in the world for the savants constituting the "Congrès de l'Association française pour l'Avancement des Sciences," but we cannot say anything else than "credat Judæus Apella" to the paper read by Drs. Burot and Bourrie at the recent meeting of the Congress in Grenoble (*vide Archives de Pharmacie*, September 5, 1886). The statements of these gentlemen concerning the effects of drugs upon hypnotized persons clearly exceed the limits of faith of even the most liberal medical editor. Burot and Bourrie affirm in their paper that sick persons in the state of hypnotism become very impressionable to the action of many substances, especially of medicines, so that these will produce their characteristic effects by only placing them in well-stoppered bottles within a certain distance of the patients.

These statements met with a good deal of incredulity (no wonder), and Dr. Luys was requested to examine the subject and report upon it. Strangely enough, Luys fully confirmed the observations of the two first-named gentlemen. Luys said he could produce nausea and vomiting by simply placing a sealed tube containing one or two grammes of powdered ipecac, without any previous notice, behind the neck of the hypnotized person. The effects produced, which include convulsions, paralysis, hallucinations, etc., are said not only to vary with the substance, but with the point of contact, so that certain substances will produce different emotional expressions, according as they are placed on the left or right side of the patient. M. Luys concludes that medical men have thus placed within their reach a new method of treatment in nervous disorders, and he states that in this way he has obtained a distinct diminution of convulsive attacks in two patients suffering from hystero-epileptic convulsions.

We are desirous of hearing more of this interesting subject. Possibly we may become converts yet.

Reports on Therapeutic Progress.

THE USE OF RESORCIN IN GASTRIC AND CUTANEOUS DISORDERS.

At the recent meeting of the British Medical Association in Brighton, DR. EDWARD MACKEY read a paper with the above title in the Section in Therapeutics. (*Medical Record*, September 4, 1886.)

He drew attention first to its antiseptic properties, pointing out that a two per cent. solution retards putrefaction, but does not irritate the tissues. Sometimes a five per cent. or even a ten per cent. solution may be employed, but then considerable irritation may be excited, while the weaker lotions are generally effectual. Internally he had usually employed 5-grain doses. It is not nasty, but the taste is easily tolerated by almost all patients. He usually gave it in water, with a

little glycerin, or in chloroform water; doses of 20 or 30 grains have been given, but they give rise to febrile disturbance, while from 30 to 60 grains cause giddiness, prostration, anxiety, collapse, and unconsciousness. He therefore did not approve such doses. It was quite true that full doses lower the temperature, but the effect is only temporary and of doubtful advantage, so that resorcin may be said now to have passed out of the list of antipyretics. Two cases of gastric ulcer, treated in the County Hospital, with 5-grain doses three times a day, began to improve as soon as the resorcin was taken, and completely recovered under the treatment. In one of these anæmia was so extreme that he had resorted to hypodermic injection of dialyzed iron, as employed by Da Costa. Twelve cases of gastric catarrh among the out-patients of the hospital, varying in age from twenty-seven to fifty, all of whom had been vainly treated by bismuth, magnesia, soda, prussic acid, and the usual prescriptions, soon got better under 5-grain doses of resorcin *ter die*. The drugs seem to stimulate and disinfect the mucous membrane. In children's diseases he had not found it so successful; he had given it in doses of 2 and 3 grains in children, but found that it neither relieved diarrhœa nor disinfected the evacuations. In skin-diseases it was a valuable parasiticide; a ten per cent. solution sometimes relieved psoriasis. On ulcerating mucous surfaces it improved the condition and disinfected the discharge, as, for example, in otorrhœa.

Mr. Wilberforce Smith said that it seemed to act like carbolic acid, and he would like to ask whether the author had separated the effect from that of physiological treatment, which was often so effectual?

Dr. Mackey replied that he had already pointed out in the paper the differences between resorcin and carbolic acid, the most important being that it was decidedly less irritant. As to physiological treatment, of course his two in-patients had the benefit of rest, proper diet, and hospital care; but among the out-patients there was little opportunity for securing such benefit, and all that could be done in such cases was to give physic, as the patients could not, as a rule, comply with other directions.

GINSENG.

Ginseng is a drug about which not a little has been written, but concerning which not much is known, at any rate not sufficient to explain the high estimation in which it is held by the Chinese. Another contribution to its literature has recently been made by Mr. Foulk, United States consul to the Corea, from which country the most valued varieties are derived. Mr. Foulk says that the plant is cultivated in the Corea, and that the ginseng is of two kinds, the red ginseng (heng-lum) and white ginseng (pak-lum). Both kinds, however, are from the same plant, the white ginseng being the root simply washed and dried, and the red the root after having been submitted to a process of curing. This process consists in prolonged steaming and dyeing, cold water being dashed over it at the end of the operation, which solidifies the root, the fracture becoming glossy and brittle, while its color is changed to a fleshy pink. The curing is a monopoly of the government, red ginseng not being an article of ordinary trade, but the whole of the crop being carried to China, and the proceeds of sales going to the king! White ginseng is used enormously in the Corea as a strengthening and blood-purifying medicine, the natives preferring it to the red, which, they say, loses strength in the curing. The most esteemed ginseng should consist of the roots of wild plants at least thirty years old, and commands fabulous prices. Mr. Foulk says that from personal experience and observation he is satisfied that ginseng is an active strongly heating medicine, but caution is required in its use, as it sometimes causes boils and eruptions, sleeplessness, and flushing of the body. It is most commonly taken in the form of a concentrated infusion, but sometimes the sliced fresh root is eaten with honey. Notwithstanding the general impression among Western nations that the virtues attributed to this drug are imaginary, Mr. Foulk thinks the evidence is in favor of the mystic value having been attached to it after its virtues had been practically ascertained. Some yellowish specimens that are met with occasionally appear to be imperfectly cured red ginseng.—*Pharm. Journ. and Trans.*, August 28, 1886.

THE TREATMENT OF SUMMER DIARRHŒA OF INFANTS.

In the summer diarrhœa of infants, the fever, when present in considerable degree, is by long odds the most dangerous symptom, and this Dr. H. C. Haven (*Arch. of Pediatr.*, July, 1886) believes to be best overcome by cold water applied by stripping the infant, laying it upon the blanket, and covering with

a sheet wrung out first in water of say 95° F., and changing the sheet every five minutes with one in which the water is gradually reduced to about 60° F. This application relieves the irritability of the nervous system; it supplies through the skin the water that has been lost from the intestines, and thus relieves the heart. It causes derivation to the skin, which can be intensified by the addition of rubefacients; this again relieves the heart and internal organs by restoring the equilibrium of the circulation. It spares the stomach and intestines from the additional irritation of an antipyretic drug. Antipyrin hypodermically or by the mouth may prove its equal; it is certainly the best substitute we have at present.

In the early stages, or even the approach of the state of collapse, opium is a most important adjunct to treatment. The bromides will often take its place, but their action is slower and possibly more depressing in the end. The study of the pulse and auscultation of the heart are necessary in addition to determine as to the time and amount of the use of alcohol and of digitalis, and other cardiac tonics and stimulants. Digitalis is a drug which, if employed rationally, is of great value, not only in this but in all diseases of infancy accompanied by a cardiac weakness. Nutrition must also be kept up if possible on account of its influence on the general condition. It must not be forgotten that food may be the initial irritant, either from changes which have occurred in it previous to digestion, as acid fermentation and putrefactive change, or subsequent to ingestion, as further fermentation, incomplete digestion, etc. Milk is the usual food of such infants, and Dr. Haven believes that the fermentative changes in the milk, which is a fluid undergoing such changes with the greatest rapidity, are the most important etiological factors; as a consequence, the first step in the treatment of this affection is to withhold milk entirely for a longer or shorter period. Its place may be taken by sugar in simple solution, white of eggs in solution in water or fresh beef juice, or the two latter combined; barley water may furnish the necessary sugar, or one or the other of the different malt foods may be employed. Fat can be dispensed with, or may be given by inunction, or, later, in almost infinitesimal doses of some sweet emulsion of cod-liver oil. The use of an alkali is further an important point in the treatment of all severe cases characterized by an acid condition of the intestinal tract. Of alkalies, Dr. Haven prefers the sodium salts, especially the benzoate or the bromide, if there is irritability of the nervous system, or the salicylate may be used for its anti-fermentative properties. The use of the latter salt has been especially recommended in this affection by Dr. A. Shank in the same number of the above journal.

THE TREATMENT OF SYPHILIS BY SUBCUTANEOUS INJECTIONS OF MERCURY.

Mr. J. Astley Bloxam (*Lancet*, August 21, 1886) recently delivered a lecture on the excellent results which he had obtained at the Lock Hospital and elsewhere in the treatment of syphilis by intra-muscular injections of a solution of the perchloride of mercury. The solution for injection contains six grains of the perchloride to the ounce of distilled water, and should be made fresh for each *séance*. Since he had adopted this method, now a period of some eighteen months, upwards of fifteen hundred cases had been treated with the best results. The sore generally begins to heal very promptly after one or two injections, the secondary symptoms are markedly modified, and, after a course of treatment extending over a year, more or less, the patient is enabled to discontinue his attendance. Towards the latter end of the course of treatment the injections may be given less frequently, and, as a general rule, not more than from eight to twelve grains of the perchloride are injected in all. It is undesirable to repeat the injections oftener than once a week, as otherwise salivation might be induced, and the quantity injected each time (one-third of a grain) is found to be quite sufficient until the next time. There are several advantages attending this method of exhibiting mercury. In the first instance, it is only necessary to see the patient once a week, when sufficient mercury is injected to last until the following week; secondly, salivation is not produced, as when the patient continued to take mercury for a whole week away from the supervision of his medical attendant; thirdly, the gastric derangements which are so apt to follow the administration of mercury by the mouth are by this means avoided; lastly, the ease and certainty of the administration, which enable the surgeon to do his own dispensing with a minimum of trouble. A little quinine is generally given during the course as a tonic, but no other form of mercury is administered.

The injection itself is a very simple opera-

tion, but certain rules have nevertheless to be observed in order to obviate any inconveniences which might otherwise result. An ordinary glass hypodermic syringe is used with a fine needle (the needle is apt to become very brittle from the action of the mercury on the steel, and requires to be replaced from time to time), containing twenty drops of the solution, equivalent to one-third of a grain of the perchloride. After filling the syringe, the needle is freed from adhering solutions by washing in order to avoid irritation in its track, and is then plunged deliberately into the muscular tissue of the buttock, selecting for this purpose the spot corresponding to the muscular mass of the glutei into the substance of which the injection is made. If this precaution be observed, no discomfort or abscess formation follows, the only solitary case in which this has occurred being attributable to the injection having been made into the areolar tissue over the trochanter. The pain of the injection is but slight, and soon passes off. It is desirable that the patient should not take active exercise immediately after the injection, as it has been noticed that blood may be effused at the point of injection, giving rise to the sensation of a severe bruise of the part, which lasts for several days. The same effect has followed the puncture of a large vessel, but in any case the result is only transient, and disappears after the lapse of a few days. If for any reason the buttock be objected to as the site of the operation, the injection may be made into the trapezius muscle at a point two inches above the superior angle of the scapula, but the injection into the buttock is attended with less inconvenience.

Mr. Bloxam mentioned that his own opinions were strongly in favor of syphilis being bacillar in origin, thus accounting for the specific action of mercury in the treatment of the disease. In support of this view, he alluded to the remarkable researches of Messrs. Eve and Lingard, whom he had furnished with blood and chancrous tissue from patients at the Lock Hospital, the subjects of syphilis.

THE NIGHT-SWEATS OF PHTHISIS TREATED BY SECALE CORNUTUM.

MINGOT reports in the *Journal de Médecine de Paris* (July 4, 1886) as to the unexpectedly favorable results obtained with secale cornutum in the night-sweats of phthisical subjects. He observed in Tenneson's clinics at Paris that 15½ to 31 grains of ergot given in powder form, or, better, 2 fl. dr. of ergotinine injected hypodermically half an hour previous to the expected appearance of the sweat, could suppress the latter for a week or even longer. No other of the numerous remedies recommended against night-sweats was, save atropine, found to have so great an effect as ergot or ergotinine. To be sure, the tubercular process is in no way influenced by the exhibition of this remedy, but it is gratifying to be able to stay one of the most annoying, and at the same time weakening, factors of the disease.

SOME NEW USES OF SOME OLD DRUGS

DR. JOHN H. JONES (*New York Med. Journal*, August 21, 1886) recommends the following uses of some old-time remedies which have proved very effectual in his hands:

I. *The inhalation of ether in non-expansion of lung*, due to adhesions of pleural surfaces, occurring after pleurisy with purulent effusion, in apneumatosis of children, and asphyxia neonatorum.

After absorption or artificial evacuation, we frequently find that a long-continued effusion in the pleural sac is followed by destructive changes in the corresponding lung. Many remedies have been tried with the object of expanding the air-vesicles and preventing the occurrence of carnification, but with unfavorable results. The most effectual treatment heretofore has been that of breathing compressed or rarefied air. But by far the best method, in Dr. Jones's experience, is inhalation of ether. He has used it on three patients with very flattering results, and can confidently recommend it to the profession as the best means of dilating the air-vesicles and restoring the lung to its natural state. If the adhesions have not been of too long standing and are not very dense in structure, they will certainly yield, and, once overcome, will be permanently obliterated. A careful mapping out of the area of dulness should be made prior to administering the anæsthetic, and, if it is found that it is not appreciably diminished after two or three administrations, it will be an indication that re-expansion is hopeless. Often, however, one administration will suffice. It is undesirable to push the anæsthetic to complete narcosis. It should be discontinued after the stage of excitement has been reached.

Its inhalation is sometimes serviceable in the capillary bronchitis of children, when we suspect that one or more of the smaller bronchi

have become impervious. It is true that counter-irritation to the affected area and emetics are frequently successful in overcoming the obstruction; but, when asphyxia seems to be progressive and is accompanied by asthenia, emetics are too depressing, and their action cannot be relied upon. Under its use the heart's contractions are strengthened, and a violent anti-respiratory (forced expiratory) action is set up, which frequently is sufficiently powerful to dislodge the offending secretion.

Dr. Jones also recommends the use of ether in the asphyxia of newly-born infants. It will sometimes succeed when artificial respiration fails. A few drops may be placed upon a piece of absorbent cotton and held to the nostrils. A better method is, after the nares have been cleansed of mucus, etc., to insinuate into either nostril a camel's-hair brush previously dipped in ether, and, by titillating its mucous membrane, we, in addition, summon to our assistance the benefit of reflex action.

II. *Bichloride of mercury and tincture of belladonna in membranous croup.*

Dr. Jones has for some years been in the habit of treating this disease with a combination of corrosive sublimate and belladonna. These drugs are recommended for this complaint in almost every work on therapeutics; but he believes that they have never been given conjointly. He has found that small doses of the bichloride ($\frac{1}{50}$ of a grain), administered in conjunction with tincture of belladonna (2 to 5 minims), every half-hour, for a child 2 years old, is a very successful method of dealing with this dangerous disease of childhood. The secret of its success is in its persistent administration, even when the symptoms are apparently most unfavorable. It is advisable to commence the treatment by administering an emetic, so as to dislodge the already-formed membrane. Probably much of the benefit derived from this mixed treatment is due to belladonna, and it is astonishing what large doses of this drug children can tolerate. During the progress of the disease the strength must be maintained by a liberally nutritious diet and stimulants, for when recovery takes place, the patient is left very anæmic and weak. This is not very apparent while the medicine is being given, as every evidence of it is partially masked by the physiological effects of the belladonna.

III. *Belladonna in sterility of females.*

There are few drugs which exhibit so pronounced a predilection to act upon certain structures of the body as belladonna. Among its favorite tissues, those of the female sexual organs may be mentioned. Its employment is followed by more or less benefit in every disease to which these parts are liable. Apparently many sterile women enjoy the best of health, and have never suffered from any irregularity of the sexual apparatus. To such he has on several occasions prescribed belladonna internally, and has found that, after taking the medicine for some weeks, they became pregnant.

ON THE PHYSIOLOGICAL AND THERAPEUTIC ACTION OF ETHOXY-CAFFEINE.

In a previous issue our readers found a review of the results and conclusions arrived at by Drs. Dujardin-Beaumetz and his pupil Pineau concerning ethoxycaffeine (*vide Bulletin de Thérap.*, March 30, 1886). In a recent issue of that journal (September 15, 1886), Dr. Chabot publishes another paper on the physiological and therapeutic action of the drug, which is worthy of our attention.

Ethoxycaffeine belongs to a series of derivates of caffeine, which were prepared by Fischer, and examined as to their physiological properties by Filehne, of Erlangen. This observer showed that the physiological properties of the caffeine derivates (hydroxycaffeine, diethoxy-hydroxycaffeine) were modified in proportion to their atomic formula, and that their degree of activity is greatly inferior to that of caffeine. The study of these bodies may be interesting enough from a chemical and physiological point of view, but the therapeutical science can, it seems, profit but little from them. Ethoxycaffeine, however, although nearly the counterpart of caffeine as to physiological action, presents, nevertheless, certain new and important features, insuring for the drug *à priori* a certain rank in our pharmacal treasures. The drug is undoubtedly a hypnotic. The experiments of Filehne have first established this fact, and the later researches of Chabot confirmed it. Ethoxycaffeine acts in the first place on the nervous centres (somnolence, augmentation, diminution of reflexes), then causes paralysis, and finally muscular rigidity. The circulation remains nearly unaltered.

From his researches Filehne draws the conclusion that "if you add to caffeine the group ethoxyl (OC_2H_5), the affinity of this chemical becomes greater for the central nervous system, and weaker for the muscular system."

Chabot has taken especial pains to verify this interesting observation.

Knowing that on injecting into a muscle a solution of caffeine the former assumes very rapidly a state of rigidity, Chabot injected successively into the muscles of the thigh of several rabbits solutions of caffeine, of ethoxycaffeine, and of salicylate of sodium. The experimenter examined in especial the action of the last-named substance, so as to avoid all sources of error. The following was the formula for the solutions employed:

℞ Salicylate of sodium, 0.25;
Caffeine, 20;
Distilled water, 3 c.c.

The injection into the muscles was performed with 4 drops of these solutions.

These experiments yielded the following results: The muscles became rigid in two to three minutes when caffeine was used, and in eleven to sixteen minutes when ethoxycaffeine was used. If the latter drug is used, the muscular rigidity is accompanied and preceded by certain general characteristic symptoms. The lively disposition of the animals subjected to the action of caffeine contrasts most conspicuously with that of the animals treated with ethoxycaffeine; in the latter animals the rigidity is preceded by paralysis.

Another fact established in these experiments by Chabot is also noteworthy. When the animals were treated with ethoxycaffeine the respiration slackened progressively at the end of three to ten minutes, while caffeine produces nothing like that. Of course there is nothing remarkable in the fact that a substance like ethoxycaffeine, which acts so energetically on the central nervous system, modifies also the vitality of the respiratory centre.

Filehne terminated his valuable paper by saying that the sedative and hypnotic action of ethoxycaffeine allowed us to hope that the drug would be of value in the treatment of megrim, especially in the cases treated previously with caffeine with some success. Dujardin-Beaumetz administered ethoxycaffeine to six patients. The drug, insoluble in water, was given in doses varying 0.25 to 1 gm. The following is the routine formula of the French therapeutist:

℞ Ethoxycaffeine, 0.25;
Salicylate of sodium, 0.25;
Hydrochlorate of cocaine, 0.10;
Linden-water (eau de tilleul), 60.00;
Syr. cappillaire, 20.00.

The cocaine was introduced into this formula in order to counteract the stomachic pains which ethoxycaffeine occasionally produces.

In the first case, that of a man aged 52 years, suffering from a very painful zone, 1 gm. of the drug was given in five doses at half-hourly intervals, with the result of producing sleep, which the preceding injections of morphine were unable to procure.

The second case was a nervous and anæmic woman, suffering from an almost continuous cephalalgia, combined with insomnia. She took 50 cg. in five doses. The last doses produced some nausea and vomiting, but the woman enjoyed a sound sleep, though previously opium was required to produce some slight rest.

In the third case, the drug again caused nausea and vomiting, but was productive of sleep.

Another patient of Dujardin-Beaumetz, being extremely troubled with megrim, took 1 gm. of ethoxycaffeine in two doses, and soon felt sensations of malaise and nausea; in a little while sleep set in, lasting for two hours. In the afternoon the patient felt so much relieved that he could devote himself to an absorbing work. In the evening the megrim returned, violent but wholly altered in its features.

Chabot made the following observations with the drug on patients: A friend of his affected with violent and frequently returning paroxysms of megrim, received the drug in the dosage and combination referred to above. Vomiting soon set in, but disappeared equally soon. Then the patient felt a sensation of general excitation, an intoxication with some slight vertigo, and an indomitable desire for motion. All these symptoms, however, soon passed off, and the patient felt so greatly relieved that he spent the afternoon visiting the Salon de Peinture. In the evening the headache reappeared.

Our observer also gave ethoxycaffeine to a young lady of 26 years of age, in whom the paroxysms of megrim returned two or three times a week. The patient could not attend to her duties, vomited often during the paroxysms, and was about to fall into a hopeless condition of anæmia. In spite of several relapses, Chabot succeeded in suppressing these paroxysms by the aid of ethoxycaffeine. The nausea rapidly disappeared, then the headache itself grew feebler, and at the end of two hours there was nothing left but a dulness in the head. These are the clinical results obtained hitherto with the drug. Any final conclusion

would of course be premature, though it seems as if the drug is destined to be serviceable in certain forms of cephalalgic neuralgia.

GALIUM APARINE.

Sir William Hooker and Dr. Arnott, in their "Field Book of British Plants," enumerate fourteen families of the genus "galium," of the natural order Rubiaceæ.

The genus takes its name from *γαλα*,—milk which some members of the genus are used to curdle.

They have square stems, leaves in whorls. The predominant colors of the flowers are yellow and white.

The *Galium aparine*, commonly called goose-grass or cleavers, according to Dr. George Foy (*Med. Press*, June 16, 1886), is one of the best known of the genus, and has long been used as a popular remedy for scrofula, cancer, and to stay bleeding. It is mentioned as a remedy for scrofula and hemorrhages by Paulus Ægnieta, and as an aphrodisiac by Dioscorides. Among the Arabian physicians Avicenna, Rhases, and Eben Baither recommended it. Culpepper, Quincy, and Lewis include it in their list of therapeutic agents, and Dr. Robert Hooper (Dict. Med.) mentions its use as a remedy for cancer to condemn it. The popular use of *G. verum* as a styptic is mentioned by Gray; but, although he names the *G. aparine*, he does not say if it has any medicinal value.

The plant is very common in English hedgerows. It flowers in June and July, and has a pretty white flower, and is easily recognized by its globular seed-like bodies with hooked prickles, by which they adhere to the skins of animals, and so become widely dispersed. Its introduction to modern practice is due to Dr. Winn, who, in 1854, read his paper on "Galium Aparine" before the Medical Society of London. His attention was first drawn to the plant by a patient who had long suffered from lepra vulgaris, and had taken all the usual remedies in vain. He informed Dr. Winn that he had at last discovered a remedy for this troublesome complaint in a common wild plant of which he did not know the name. Dr. Winn found the plant to be *Galium aparine*, and, on making inquiries, learned that three other persons in that district had been cured by the same remedy. Dr. Winn tried it in nineteen cases of skin-disease,—five were cases of lepra, six of psoriasis, four of eczema, two of lichen, one of inflamed acne, and one of ordinary colored syphilitic eruption. In nine of these cases the benefit derived from the medicine was very striking. Dr. Bully, of Bucks Hospital, forwarded to Dr. Winn an account of three cases of cancer in which the *G. aparine* appeared to exercise an influence in checking the disease. The preparation used by Dr. Winn was an inspissated juice in ʒiv-doses three times a day. A formula for an infusion and ointment is published in Beasley's Pocket Pharmacopœia.

Eight years after Dr. Winn's paper Dr. Ogle recommended the drug as a remedy for epilepsy, and quite recently Surgeon-Major Orwin draws attention to the benefit derived from its use in an obstinate case of psoriasis of the left hand of twelve months' standing, after crysophanic acid, tar ointment, arsenic, etc., had been tried in vain. The rash disappeared by the use of *G. aparine* taken as an infusion and externally applied as a poultice. As there is no difficulty in securing a supply of the fresh plant, and its time of flowering, which will allow of its easy recognition, being near at hand, it would be advisable to submit the plant to a fair trial, and if found worthy of a place in our list of remedies, its inexpensiveness and habitat should not be allowed to militate against its use.

HAMAMELIS VIRGINICA IN HÆMOPTYSIS AND OTHER AFFECTIONS.

Dr. A. Brondel writes to the *Bulletin Général de Thérapeutique*, September 15, 1886, as follows:

"Last year I saw Dr. Boucommont arrest before my eyes two hæmoptyses by means of the fluid extract of hamamelis in doses of 40 to 60 drops repeated three times *pro die*.

"I have employed the same extract successfully in pulmonary congestions, which yielded with admirable promptness to the daily ingestion of 3 to 4 teaspoonfuls of the remedy.

"Besides, I have frequently given and taken myself the extract in the beginning of inflammatory conditions of the larynx or trachea. Combining the extract of hamamelis with aconitine, I could in the latter affection produce a rapid cure.

"In the initiatory phases of rheumatism an hour after absorption of the remedy a marked relief and resolution of the inflammation will take place."

PHYSIOLOGICAL ACTION OF VANILLIN.

According to Dr. Gasset, vanillin, which gives the aroma to vanilla, belongs among

the aromatic aldehydes (aldehydes benzoic, cinnamic, etc.). Many cases of poisoning occur among workers in vanilla and persons who have eaten foods containing vanilla. These are due to vanillin. According to experiments made on frogs, vanillin has a convulsive action, exercised principally on the spinal cord; this convulsive action is succeeded by depressive action, exerted equally on the spinal cord and motor nerves; the sensory nerves remain unaffected. Vanillin has a local irritant action. Hypodermically injected into dogs it raises the temperature half a degree. In frogs, $\frac{3}{4}$ to $\frac{9}{10}$ of a grain is a poisonous dose; the toxic dose for higher animals has not yet been determined. Vanillin checks putrid fermentation, and in its physiological properties seems to be a diminutive strychnine. Its best physiological antidote or antagonist is chloral hydrate.

It may be used with advantage as a gastric stimulant, especially in atonic and fermentative dyspepsias. In ¾-grain doses it may be used as a corrigent for remedies badly borne by the stomach. In case its excito-motor properties are desired, it may be administered in a gummy vehicle in 3- to 3½-grain doses. —*Western Druggist*, September 4, 1886.

THE USE OF COCAINE IN THE HYPODERMIC TREATMENT OF SYPHILIS.

The pain attending the hypodermic treatment of syphilis, no matter whether calomel, corrosive sublimate, the cyanate or formamidate of mercury is used, is a serious drawback to another equally efficient as convenient mode of medication. This objection becomes especially appreciable in cases where the hypodermic method of treatment for various reasons cannot be supplanted by any other, particularly the inunction cure.

MANDELBAUM reports in the *Monatschrifte für Praktische Dermatologie*, 1886, No. 6, two such cases, ladies, in whom, for certain reasons, the treatment had to be kept secret. These patients could be best attended to after office-hours at the physician's residence, the cyanate of mercury being injected according to the requisites of the case. Unfortunately, they proved so susceptible to the pain connected with the operation that the injections had to be abandoned. Induced by the publication of Wölfler of the anæstheticizing action of cocaine injections, Mandelbaum tried the following combination with the greatest success:

℞ Cocain. muriat., 0.05;
Hydrarg. bicyanid., 0.01;
Aquæ dest., 1.00. M.
S.—For hypodermic use as one dose.

At first Mandelbaum injected the cocaine solution first, and then, after two or three minutes, the mercury; later he found the simultaneous exhibition of cocaine and mercury to be more convenient and equally effective.

The assistance of these cocaine injections recommends itself also in the use of other hypodermically applied drugs, with the view to eliminate the attending pain.

THE INGREDIENTS OF DIGITALIS.

A short time since, in a communication to the Academy of Medicine, M. LAFON called attention to the differences in the characters of the substances supplied by manufacturers under the name "digitalin," and whilst claiming that the articles supplied by French makers correspond to the requirements of the Codex, of being freely soluble in chloroform, only slightly soluble in ether, and giving a green color with hydrochloric acid, and are therefore really digitalin, implied that German makers always send out something else under the name. This charge has induced the firm of E. Merck, of Darmstadt, to issue a reclamation, containing some interesting information which may be worth putting on record. In the first place it is recalled that Schmiedeberg, in his classical research (*Pharm. Journ.*, v. 741), showed digitalis leaves to contain (1) digitonin, a substance resembling saponin in its properties, without the specific digitalis action, and soluble in water; (2) digitalein, an amorphous glucoside soluble in water; (3) digitalin (Schmiedeberg's), a crystallizable glucoside, insoluble in water; (4) digitoxin, insoluble in water, a non-glucoside, but passing under treatment with an acid, without splitting off of glucose, into toxiresin; and (5) digitin, or passive digitalin, an inert crystalline body. These individual substances are said to occur in different proportions in commercial "digitalins," which would therefore vary accordingly in their therapeutic action. The principal commercial preparations are thus described: (1) "Digitalin, pur. pulv.," or "German digitalin," consists principally of digitalein, with some digitonin and digitalin. Digitalein in consequence of its ready solubility in water is not cumulative in its action, and causes no irrita-

tion when subcutaneously injected. Freely soluble in alcohol, and insoluble in ether and in chloroform. (2) "Nativelle's crystallized digitalin." Physiologically extremely active. In fine white needles, bitter in taste, insoluble in water, ether, and benzol, freely soluble in chloroform. Consists almost entirely of digitoxin, and is cumulative in its action. Typical of French digitalin. (3) "Homolle's amorphous digitalin." White or yellowish-white, very bitter powder, slightly soluble in water and in ether, freely soluble in ninety per cent. alcohol and in chloroform. Consists principally of digitalin with some digitoxin. (4) "Digitalin, pur. pulv. (Merck)." Yellowish-white powder, corresponding in its properties with No. 1. Merck also prepares (5) a "crystallized digitalin" identical with digitin, difficultly soluble in water, more readily in alcohol, and insoluble in ether and in chloroform; as well as (6) "digitoxin," the most poisonous of all the digitalis bodies, cumulative in action, crystallizing from alcohol in concentrically grouped needles, freely soluble in chloroform and in alcohol, and sparingly soluble in ether. Further, the amorphous "digitalins" of the Codex and the Belgian Pharmacopœia are said to consist essentially of digitalin, with some digitoxin, and to correspond to Homolle's amorphous preparation. —*Pharm. Journ. and Trans.*, August 28, 1886.

THE PHOSPHATES IN THERAPEUTICS.

LOGEAIT writes in the *Archives de Pharmacie*, September 5, 1886, the following concerning the value of phosphates in the treatment of diseases:

The medicinal worth of the phosphates of lime has hitherto been singularly overrated. The triple phosphate of lime, the biphosphate and monophosphate (acid phosphate), as well as the other principal preparations, such as the chlorohydrophosphate, lacto- and citrophosphates, are gradually disappearing from the field of practice, their places being occupied by the phosphates of potassium and sodium. Very recent observations have yielded the fact that the action of the phosphates of lime is exceedingly uncertain and doubtful, as they cannot be absorbed in the economy. No doubt, says Logeait, the soluble phosphates of lime remain dissolved as long as they are in the stomach, and the insoluble preparations become dissolved by the action of the gastric juice; but as soon as they have passed into the duodenum, the alkaline bile precipitates them at once, and renders them insoluble again. Hence through the greater part of the entire intestinal tract they act as totally inert matters, and are finally rejected with the rectal discharges.

It is different, however, with the phosphates of potassium and sodium, which are equally soluble in acid, alkaline, and neutral menstrua; they remain dissolved during their entire passage through the digestive channels, and are consequently resorbable.

The absorption of phosphates of lime is by no means indispensable to the explanation of the formation of osseous tissue. We can logically presume that the soluble salts of lime alone are absorbed, which precipitate neither in an acid nor an alkaline medium.

These salts meet, in the deeper channels of the economy, the phosphates of sodium and potassium, arriving with the same conditions of solubility, and form thereby double decomposition phosphate of lime.

URINARY INCONTINENCE OF CHILDREN TREATED BY ANODYNES PER RECTUM.

It is safe to say that the modes of treatment usually recommended for this distressing infirmity are frequently ineffective and disappointing. In the *Boston Medical and Surgical Journal*, September 16, 1886, DR. EDWARD T. WILLIAMS states that for the last year or two he has been employing, with complete success thus far, the use of anodynes by the rectum in the form of injections, suppositories of morphine, belladonna, and atropine, and he states further that he has not only cured six cases by these means, but temporarily relieved many more who have passed out of sight during treatment. He finds that morphine alone relieves for the time being, but does not cure. Belladonna and atropine are curative when taken long enough, although he finds them to be better borne in combination with a little morphine, which counteracts some of their bad effects and enables them to be given more continuously. Furthermore, the requisite dose of belladonna is smaller when combined with morphine. When these medicines produce headache or undue nervous excitability, he uses the bromides as a corrective or suspends their administration for a time. He has found no case where they could not be borne when properly given.

As to the mode of administration, a fifteen-grain suppository of cocoa-butter is most easily handled. They should contain a proper amount of extract of belladonna and morphine. For a child 5 years old, say, one-

eighth of a grain of belladonna extract, and one-sixteenth grain of morphine; but the doses must be carefully adapted to the particular case in hand, beginning with a small dose, with a smaller relative proportion of belladonna, and increasing the latter and diminishing the morphine as toleration becomes established.

If an enema or clyster be preferred, it should consist of about a drachm of lukewarm water, with a few drops of atropine and morphine solution added, and administered with the small hard-rubber syringe (No. 2), especially designed for the purpose. The old-fashioned clyster of starch-water and laudanum is absurdly out of date. Dr. Williams has used nothing for years but morphine and warm water, mixed as for a subcutaneous injection, only that the water should be tepid and not exceeding a drachm in amount. Dr. Williams uses two solutions. The first consists of one-sixth grain of morphine and twenty minims of water. The dose by drops therefrom is the same as that of laudanum, which makes it especially convenient for the nurses. The other is one-sixtieth grain of atropine to twenty minims of water. Reckoning one-sixtieth of a grain as an average commencing dose for an adult, the dose for a child may be graduated by drops precisely as with laudanum. For a child 5 years old, then, as an enema, one might give for a commencing dose from 3 to 5 drops of each solution, mixed with a teaspoonful of warm water. These doses may be differently combined or altered in any way to suit a particular case.

PIPER BETEL LEAVES.

According to Messrs. Jehe & Co. (*Handelsberichte*), a supply of the leaves of the *Piper betel* L., which are used in India for chewing with areca-nut, has recently been imported into Germany. An essential oil obtained from the leaves by distillation at Samarang by Schmitz, has been credited by him with having given good results in the treatment of catarrhal disorders and as an antiseptic. This claim has been substantially confirmed by Dr. Kleinstück, of Jena. The oil, which seems to be of an aldehyde nature, is said to oxidize with extreme rapidity, losing at the same time its characteristic ethereal odor and therapeutic properties. Great care will, therefore, be required in the transit of the leaves if the oil is to be distilled in Europe.

THE DIRECT ACTION OF CALCIUM, SODIUM, POTASSIUM, AND AMMONIUM SALTS ON THE BLOOD-VESSELS.

Dr. H. G. Beyer has been investigating the action of the above salts on the blood-vessels, and publishes his experiments in the *Medical News*, September 4, 1886. He formulates his conclusions as follows:

1. Calcium salts cause the vessels to contract by virtue of their stimulating influence on the vaso-motor ganglia.

2. Sodium and ammonium salts excite, first, the ganglia of the vaso-dilators, next those of the vaso-motors; hence producing at first dilatation and afterwards contraction of the vessels.

3. Potassium salts stimulate the ganglia of the vaso-dilators only, and consequently produce dilatation. If, however, as was shown in two observations, the dilatation which they produce is followed by contraction, this contraction is so extremely slight that it may practically be neglected. Therefore any stimulating influence on the vaso-motor ganglia which they might possess is insignificant when compared with that which they exert over the vaso-dilators.

CLINICAL EXPERIENCE IN TYPHOID FEVER.

Dr. Aufrecht, chief of the City Hospital of Magdeburg, favorably known to the profession both as clinician and as author, publishes from time to time, under the title of "Pathological Communications," a little pamphlet, intended to represent the clinical experience gathered at that institution. The third number issued this year, treating of typhoid fever and its therapeutics, deserves to be carefully examined.

The clinical material embraces five hundred and fifty-one cases of typhoid fever that during the last six years came under Aufrecht's observation. Of these fifty-eight (*i.e.*, 10.5 per cent.) died, four even within twenty-four hours after admission to the hospital.

Aufrecht declines to regard the elevation of temperature alone as an indication for the bath, and employs the latter only in patients who, together with a temperature of 40° C., present a small but frequent pulse, and either nervous ataxia or delirium. Cases marked by a good, firm pulse, and freedom from nervous symptoms, were invariably found to take a favorable course without baths, in spite of the height of the temperature, while, on the other hand, the bath employed in accordance with

the above indications proved also a constant success. Frequently a single bath sufficed to reduce the temperature 2° to 2½° C., to raise the working energy of the heart, and to eliminate threatening nervous symptoms. The number of baths usually required never exceeded five or six, given on three consecutive days. The author emphasized the maxim that in typhoid fever the mere elevation of temperature does not justify the employment of baths.

The routine practice in the Magdeburg Hospital is to give the typhoid fever patients a weak solution of muriatic acid (15 drops; 6 oz. water with 1 oz. syr. simpl.), an ice-bag placed upon the epigastric region, and another one on the head in case of cephalalgia. Most patients received also a tablespoonful of Hungarian wine every two hours, a practice which Aufrecht, however, does not approve of in private patients, these having generally a greater amount of albumen in store than hospital patients.

If the evening temperature is beyond 39.5° C., and the above indications for the use of the bath are absent, the patient receives, beginning with the next morning, daily, 7¼ grains of hydrochlorate of quinine. Except these small doses of quinine, which only exceptionally in rare cases were doubled, Aufrecht used no other antipyretic. To prevent decubitus every patient is at the very beginning of the treatment placed upon a water-bed. In this manner Aufrecht has avoided all cases of decubitus for the last two years.

The febrile dryness of the tongue may, our author believes, lead to grave consequences. The mucous membrane is gradually being broken, swallowing is rendered painful, and the patient refuses or is unable to take food. Speaking is likewise rendered difficult if not impossible for the same reason. Nor is it unlikely that through the broken mucous membrane of the larynx and pharynx bacteria penetrate the submucous tissues, and give rise to various grave local and even constitutional disturbances. This difficulty cannot, as might be presumed, be obviated thoroughly even by constantly-repeated draughts of water. Aufrecht applies, as soon as the tongue begins to dry up, glycerin, every two hours or more often, to it in so thick a coat that a part of the drug, through the induced motions of swallowing, reaches the hindmost portions of the pharynx and larynx. This procedure protects the parts from tears and crust formations.

Diarrhœa was combated by opium if the stools exceeded the number of four in twenty-four hours. The drug is given in powder form, in ½-grain doses, two to four times daily.

In intestinal bleeding the liquor ferri was found to be wholly useless and, besides, irritating to the digestive functions. To decrease the peristaltic movement the patient received ¼ of a grain of morphine and two Pravaz syringes of a watery solution of ergotine (1 to 10). The latter solution is to be absolutely fresh, as in older ones germ-formation readily takes place. Friedländer's sterilized hypodermic solution will, of course, henceforth be exclusively used.

The vomiting often observed in typhoid fever patients in connection with peritonitic symptoms is by Aufrecht referred to intestinal ulcerations encroaching upon the peritoneum, and is treated by morphine given per os, or in obstinate cases hypodermically. This medication exhibited at the very beginning of the vomiting may possibly, in many cases, prevent a peritonitis, of which the vomiting is simply a premonitory symptom.

An especial value is placed on morphine in the cases marked by intense delirium.

Meteorism is best treated with ice applied to the epigastric region, and with small doses of morphine.

In conditions of collapse the hypodermic injection of camphor is unquestionably the most efficient remedy. The oil of camphor (6 camphor—24 oil of sweet almonds) is a very eligible preparation for this purpose. Aufrecht uses as much as 30 grains of camphor—*i.e.*, ten Pravaz syringes daily—even for several successive days. Abscesses have never been observed after these injections of oil of camphor.

Dr. Friedländer, of Berlin, the discoverer of the sterilized hypodermic solutions (*vide* leading article of August issue of the THERAPEUTIC GAZETTE), exhibited his preparations at the exhibition of German physicians and naturalists meeting in Berlin on September 18, and, as was to be anticipated, was the recipient of unqualified praise and commendation from all quarters. These sterilized solutions will be certain to meet with a warm reception also in this country.

In this connection we beg to state that Dr. Friedländer, who is a chemist of high standing in the German metropolis, is the proprietor of Simon's Apotheke, and has, as we understand, good reasons not to be mistaken for another gentleman having the same name who also owns an apothecary's shop in Berlin.

THE INFLUENCE OF ALCOHOL ON THE FUNCTIONS OF THE STOMACH.

Dr. Gluzinski has just published in the *Deutsches Archiv für Klinische Medicin*, 1886, vol. xxxix., B. No. 9, the results obtained by his experiments instituted to ascertain the influence of alcohol upon the gastric functions. We epitomize his main conclusions by the following theses:

1. Alcohol disappears quickly from the stomach.

2. Aldehyde cannot be recovered, and alcohol very probably enters, as such, the circulation.

3. The digestion influenced by alcohol can be divided in two distinct periods,—viz., one, during which alcohol is still present in the stomach, and another after its disappearance.

4. The first period is characterized by an impeded or rather slowed state of digestion of albuminates, the second by the secretion of an energetic and concentrated gastric juice.

5. The mechanical working power of the stomach is moderately diminished.

6. The secretion of gastric juice after completed digestion lasts considerably longer than without the presence of alcohol.

7. Under the influence of alcohol larger quantities of fluid collect in the stomach, and assume through the action of the bile a yellowish coloration.

Comparing these results with daily experience, according to which alcohol is known to facilitate digestion, especially after a copious ingestion of food, it must be conceded that alcohol in small doses actually exerts a favorable influence upon the functions of the stomach. Especially to be noticed is the increased quantity of free muriatic acid which, at the time when the alcohol itself has long left the stomach, effects the digestion of large quantities of albumen. The momentary slowing of digestion during the first period after the ingestion of a small quantity of alcohol, such as a glass of cognac, is of too short a duration to be at all considered. The experimenter even saw that 100 c.c. of twenty-five per cent. alcohol left the stomach in fifteen minutes, and that instead of a slowing of digestion the secretion of an active gastric juice took place. The impediment to the mechanical functions of the stomach is, after small quantities of alcohol, likewise too trivial to require any consideration.

Different, however, are the results obtained after the use of larger quantities of alcohol. The slowing of digestion is now considerable; the mechanical functions are distinctly impeded, necessitating a longer stay of the food in the stomach. Hence it is clear that alcohol in large doses decreases the quickness of digestion.

To obtain the salutary effects of small doses of alcohol it is necessary to administer them some time before the meal, so as to bring the food at once into the second period which, as stated above, is favorable to digestion.

Another series of experiments made to ascertain the influence of alcohol upon digestion in a pathologically altered stomach claims likewise our attention, and can be thus resumed:

The use of stronger alcoholic drinks is unadvisable in conditions of an abnormally increased or decreased acidity of the gastric juice. In cases calling for excitantia, alcohol is nevertheless to be given, though best some time before the meal for reasons intimated above.

These results throw no favorable light upon the conducive virtues of the numerous pepsin-containing alcoholic preparations, the use of which is recommended in all cases of an impeded digestion without regard to the cause. Besides, it is rather likely that alcohol precipitates pepsins, and ought for this reason not to be associated with the latter.

CONTRIBUTION TO THE ACTION OF URETHAN EMPLOYED SUBCUTANEOUSLY.

It seems as though urethan is but slowly making its way into the practice of neurologists, though the favorable reports concerning its sedative and hypnotic effects, formerly sparse and possibly unreliable, begin now to be announced somewhat more frequently and from more authoritative sources.

Not long ago, Dr. Rottenbiller, who had given urethan a very fair trial, spoke in very favorable terms of the drug, especially of its hypodermic application, in the *Centralblatt für Nervenheilkunde*, 1886, No. 10. Induced by Rottenbiller's eulogization of the remedy, Dr. Wilhelm König, of Dalldorf, instituted a series of clinical experiments with urethan, and communicated the results obtained to the *Centralblatt für Nervenheilkunde*, June 15, 1886.

Urethan was exclusively tried on patients with a high nervous excitation; as for lighter cases, remedies of a prompter and safer nature are more suitable, and hypodermic medication besides is a relatively inconvenient measure.

Ten paralytic patients were, for the sake of

an easier superintendence, placed together in one room, and received for seven continuous days, at 8 o'clock P.M., one to three Pravaz syringefuls of a fifty per cent. solution of urethan, each syringe containing about seven grains of urethan.

The effects of this medication were still less satisfactory than those obtained by König from the internal administration of the drug. Besides, some patients soon refused to allow any more injections, partly because they were in no way benefited by them, and partly because they were annoying and painful.

König found that the patients came but very slowly and late under the influence of the hypnotic, hours usually passing before sleep set in. In one instance only the patient fell asleep at 8.45 P.M. The following table represents the percentages of obtained successes:

Dose.	Successes.
1 syringe (7 grains of urethan)	47 per cent.
1½ syringes (10 grains of urethan)	25 per cent.
2 syringes (14 grains of urethan)	33 per cent.
3 syringes (21 grains of urethan)	0 per cent.

König abandoned the experiments on the seventh day, feeling convinced that in conditions of high-graded excitation the action of the drug, in doses safe and convenient to administer, was not sufficiently energetic to warrant its employment.

König also mentions that in nearly all patients who received the drug the appetite was found to be decreased on the third day. Other secondary effects, though, were not observed.

These rather negative results obtained with urethan recall the equally unsatisfactory experiments made with the same drug by Dr. Bock, of Pankow, as reported by the observer himself in the February issue of the GAZETTE, and differ strangely from the alleged successes of Von Jaksch, Rottenbiller, and others. As long as this state of uncertainty regarding the actual therapeutic worth of urethan lasts, the practitioner ought not to feel called upon to relinquish the old and tested stand-bys for a new and unreliable agent.

ON PELLETERINE IN CHILDREN.

It is known that pelleterine sometimes produces in adults symptoms of intoxication, and the question how does the drug act on infants is therefore a practically interesting one. MÉPLAIN writes to the *Bulletin de Thérapeutique*, July 15, 1886, that having been in charge of a child 2½ years old affected with tænia, in which all other anthelmintics proved useless, he prescribed 1 grain of pelleterine to his little patient, and was gratified to find the drug doing its work. The worm passed, and no untoward symptom was observed in the child. Méplain says that a small dose of pelleterine suffices to expel the tænia in a child, and children seem comparatively less susceptible to the toxic action of the drug than adults.

The drug, however, concludes the writer, ought to be of an irreproachable activity.

THE INTRA-UTERINE STEM IN THE TREATMENT OF FLEXIONS.

At a meeting of the Chicago Medical Society, held June 7, 1886, PROFESSOR A. REEVES JACKSON read a paper entitled "The Intra-uterine Stem in the Treatment of Flexions," exhibiting the stems used (*Chicago Medical Journal and Examiner*, August, 1886). The essayist began treating uterine flexions with the stem pessary in 1870. Prior to that time the only methods he had employed were gradual dilatation and incisions. The results were so unsatisfactory that he sought for a safer and more successful method. Having received the impression that the use of the stem pessary was more hazardous than either the dilating or cutting plans, he commenced its employment with misgiving, and did not rely wholly upon it, but preceded it with either gradual stretching or slight incisions. In two cases this mixed method was followed by pelvic abscess, a sequence which he had never observed when the stem alone had been used. All cases of uterine flexion are not accompanied by dysmenorrhœa or sterility, yet when there exists a relationship between these symptoms and an existing flexion, the latter must be looked upon as a mischievous factor, and one that should be removed. He had never treated any case of flexion in which dysmenorrhœa was not present, although coexistent barrenness has been frequently an additional incentive to the patient to undergo efforts at cure.

He preferred Chambers's bifurcated vulcanite instrument, although the divergence of the branches *below* the internal os uteri was a radical defect in the instrument as ordinarily used. Frequently the branches should be closed so that the stem might be practically single in that portion which traverses the cervix. His method is as follows: A flexion and its direction being diagnosticated, a flexible bougie is passed through the bent portion of

the canal and quite to the fundus. The depth of the canal being carefully noted, a pliable stem, consisting of the distal portion of the same, or a similar bougie, one-third of an inch shorter than the ascertained depth of the canal, is selected for introduction. A flange or bulb is formed upon the outer end of the stem by rolling upon it a section of rubber tubing. The woman being placed on the back, in Simon's position, and the os uteri exposed with a speculum, the stem, either grasped with a dressing forceps or mounted upon the end of a piece of pointed wire, is passed entirely into the uterus. A large tampon of cotton, moistened with slightly alumized glycerin, is pressed against the bulb of the stem, and allowed to remain one or two days. The tampon is removed and replaced at suitable intervals, until the tendency of the stem to leave its position disappears. After this yielding stem has remained from one to three weeks, according to the degree of tolerance manifested by the uterus, it is removed, and a thicker one put in its place. This likewise is permitted to remain a week or two, and is then replaced by a Chambers stem. While not very much, or, indeed, any change of shape is to be expected in consequence of the use of the flexible stem, yet, in several instances, a very considerable alteration took place within a few weeks, or even a few days, and in a few cases it was found unnecessary to resort to a rigid instrument at all. Usually, however, it had been necessary to use an inflexible instrument for from three months to a year, not continuously, but for periods of three or four months, with an interval of a week or two, during which the stem was removed in order to test the degree and permanence of the improvement. The feature of this treatment, which is essential to its safety and success, is its slow and gradual conduct, and the non-observance of this necessity has been the cause of dangerous results and failures to cure.

The drawbacks attending this method of treatment were: 1. Difficulty in retaining the instrument in position; 2. Pain; 3. Hemorrhage; 4. Pelvic inflammation; all except the first being common to all other methods of treatment. A table comprising the details of 64 cases treated by the intra-uterine stem alone was given, showing the ages and social conditions of the patients, the direction of the flexion, and the result of the treatment. Of the entire number, 42 occurred in married and 22 in single women. Of the former, 8 had borne children; the other 34 were sterile. Of the latter, 8 subsequently bore children. A cure of the flexion followed in 40; of the remaining 24, 4 were improved and relieved of dysmenorrhœa. In 20 the result was unknown. The ages of the patients ranged from 19 to 39 years. The uterus was anteflexed in 50 and retroflexed in 14.

In conclusion, the author said, "I believe the principle of the intra-uterine stem in the treatment of flexions to be correct; and it need not be dangerous, at least, no more dangerous than any other effective method. I further believe that by its use more cases of uterine flexion can be cured than by any other means at present in vogue. The conditions of both safety and success are watchfulness, patience, and slow progress."

NOVEL TREATMENT OF DIPHTHERIA BY DIGITALIN AND SULPHIDE OF CALCIUM.

We condense the following important therapeutical considerations from the *Archives de Pharmacie*, September 5, 1886:

Dr. Galicier some time ago eulogized a novel form of treating diphtheria, which, it seemed, had given excellent results. A paper appearing in the *Moniteur Thérapeutique* of August, 1885, by Dr. Cug, of Pau, in which this physician claims to have saved two cases of diphtheria,—two boys, aged 4½ years and 5 months respectively,—calls our attention anew to the plan proposed by Dr. Galicier. This physician orders the following pills:

℞ Sulphide of calcium, 0.05;
Digitalin, 0.001;
Arseniate of quinine, 0.001. M.
Fiant pil.
S.—Take one every hour, day and night.

Both Cug and Galicier claim that no intoxication was ever produced by this remedy.* The great general intoxication probably prevents any further intoxication from the part of digitalin.

The pills are usually continued for a couple of days.

LOCAL ANÆSTHESIA FOR ELECTROLYSIS.

Dr. Franklin H. Martin, Professor of Gynæcology in the Chicago Polyclinic, writes

* To give 2 cg. of digitalin in twenty-four hours from the beginning to a child seems in our judgment a rather hazardous treatment, provided the drug is not inert, as many specimens in the market actually are.

to the *Medical Record*, October 9, 1886, as follows: "Where it is necessary to use a very strong current of electricity for purposes of electrolysis, or any other purpose, and a reliable means of measuring the current, other than by the sensations of the patient, is at hand, it is very desirable oftentimes to have some means of producing anæsthesia. Especially is this the case with women who have been brought to an anæmic and nervous condition from menorrhagia coincident with a fibroid growth of the uterus. In these cases, where electro-puncture is used as a means of removing the growth, or even where the somewhat milder electrolytic current is employed for the purpose of causing absorption of inflammatory exudates, there is a very disagreeable burning sensation experienced at the positive sponge electrode. By utilizing the properties of the galvanic current, discovered by Haertner, viz., the direct transference by the galvanic current of particles in solution through permeable bodies in a direction from the positive to the negative pole of the battery (the *cataphoric* action of Du-Bois Raymond), a very satisfactory condition of local anæsthesia can be accomplished. The method adopted is as follows: Before applying the positive sponge electrode to the surface, moisten the sponge with a one-fourth of one per cent. solution of muriate of cocaine. As the current is turned on, it will be found that the absorption of sufficient amount of the cocaine is immediately promoted to produce a complete state of anæsthesia of the surface beneath the electrode. This, of course, does not affect the point of application of the negative pole,—the point of introduction of the needle. Cocaine can still further be utilized here by injecting hypodermically a small quantity of the aqueous solution at the point of introduction of the needle through the skin, or by applying a solution of the oleate upon the mucous membrane of the vagina or uterus, if the needle is introduced in this location. By bearing these simple facts in mind, electrolysis for fibroid tumor can be made familiar without the necessity of administering a general anæsthetic."

ON SALICYLATE OF BISMUTH.

DR. SOLGER publishes in the *Deutsche Medicinal Zeitung*, No. 22, 1886, some interesting therapeutic facts concerning the salicylate of bismuth, a drug which appears worthy of our attention.

Solger first exhibited the remedy to a German physician, who for ten years had suffered from frequently returning pains in the region of the sigmoid flexure. Laxatives, medicinal waters, diet, electricity, nervines, in brief, everything that therapeutists could suggest, were either useless or even deteriorated the condition of the patient. Using for fourteen days salicylate of bismuth, in doses of 12 grains three times daily, the patient got rid of his pains and recuperated fully his broken-down health. A return of the pains some time after yielded also to a fourteen days' medication with salicylate of bismuth.

Later, Solger has given the drug to numerous patients, both in private and in hospital practice, and has obtained surprising results with it. He has, however, reduced the average dose from 12 grains to 8 to 10 grains, without obtaining any less satisfactory results. The following formula represents, according to Solger, the most effective and convenient mode of employing the drug:

℞ Bismuth. salicyl.,
Sacchari lactis, āā ʒvi. M.
F.—P., divide in p. æq. No. 40.
S.—One powder every eight hours.

The drug occasions no inconvenience, either when taken on an empty stomach at six o'clock in the morning, or after dinner at two o'clock, provided the dry powder is washed down with a little water. Given in wafers, the drug is apt to produce some gastric irritation.

Solger gave the drug principally in chronic diarrhœa and intestinal catarrh, especially after other remedies had failed. An aged lady, who, suffering from a chronic intestinal catarrh and involuntary discharges from the bowels, had been reduced to a stage of profound emaciation, and had for years been confined to the bed, regained in three months her health by the use of salicylate of bismuth. In another case, a demented woman, troubled with chronic diarrhœa and incontinence of urine, took the drug for several months, and recovered not only from her grave physical ailments but also gained a certain low degree of intelligence. In phthisical subjects the drug proved likewise very valuable in arresting the exhausting diarrhœas and inducing a state of comparative well-being.

Noxious effects can only appear in cases of intestinal obstruction combined with a low nutrition. Among the symptoms of an incipient intoxication Solger mentions nausea, a furred tongue, and pressure in stomach and bowels. The tongue gives an especial warning by pre-

senting a gray appearance, with a black streak in its longitudinal axis. The trouble is, however, easily relieved by a good dose of castor oil, or any other laxative, and is no indication for the suspension of the drug.

In the ectatic conditions of the stomach, and especially in stenosis of the pylorus, the drug is contraindicated. Investigating these beneficent effects of salicylate of bismuth in the mentioned gastro-intestinal affections, we cannot attribute them to the (moderately) astringent properties of bismuth, but are justified in viewing the disinfectant influence of the drug upon the intestinal contents as its principal therapeutic factor. In this respect the drug can be placed on a line with naphthalin, only that the latter drug is not nearly so well borne by the stomach as salicylate of bismuth. Both drugs check the profuse propagation of bacteria and micrococci in the intestines, and thus produce curative effects in the affections mentioned.

BALSAM OF COPAIBA IN GONORRHŒAL OPHTHALMIA.

Dr. S. Haynes, of Saranac, N. Y., writes to the *New York Medical Record* (October 9, 1886) that he was called to see an infant, four days old, who was suffering from conjunctivitis, contracted from the mother, who had gonorrhœa at the time. The inflammation had existed two days, and the cornea was found covered with thick pus, and the eyelids were so swollen that they could be separated with difficulty even when the child was under the influence of chloroform. For several days the remedies used seemed only to hold the disease in check, and the infant meanwhile was rapidly losing flesh. Severe stomatitis was also developed. Applications were now made of balsam of copaiba to the temples, the external surface of the lids, and above the eyebrows three times a day, a little being occasionally inserted between the lids. The pus was carefully removed every hour by pledgets of cotton, wet with solutions of alum or sulphate of zinc, and fresh butter was applied to the edges of the lids every night. From the commencement of the use of the balsam a marked improvement was noticed, and in three or four weeks the cornea was perfectly clear and free from disease, and the child had gained in flesh. The case had everything against it, as the parents lived six miles away and could be visited only occasionally, the mother was confined to bed for a great part of the time, and the family were ignorant and suffered from the want of many of the necessaries of life. Dr. Haynes states that the use of the balsam of copaiba was suggested by an article which he read some time ago, but he has forgotten both the name of the writer and the medical journal in which the article appeared.

OXYMEL SCILLÆ IN WHOOPING-COUGH.

Dr. Netter has recently read a paper before the Congress de l'Association française pour l'Avancement des Sciences (*vide Archives de Pharmacie*, September 5, 1886), which, like all other therapeutic suggestions pertaining to pertussis, recommends itself to the notice of the practitioner.

Netter advocates the use of the oxymel scillæ, prepared strictly according to the prescription of the Pharmacopœia, as an efficient remedy in whooping-cough. He gives the preparation pure without any excipient, and orders it in the following doses:

For suckling infants, 20, 40, to 60 drops in twenty-four hours, in the intervals of nursing.

For children of about 2 years of age, 4 to 5 teaspoonfuls, taken afternoon and evening, in intervals of six minutes.

For children 3 years of age or older, 6 to 7 teaspoonfuls, taken similarly as above.

For adults, 8 to 9 teaspoonfuls, taken in the same manner.

His observations at the Hospital of Nancy went to show that the remedy administered under these conditions proved very efficacious. It is indispensable that the stomach be empty when the drug is taken, and the latter may be continued until the disappearance of the paroxysms.

Dr. Rémy confirmed Netter's observations, and stated that under this medication whooping-cough could be cured in about a week's time, and sometimes even sooner than that.

FAILURE OF LARGE DOSES OF ANTIPYRIN IN A CASE OF SUNSTROKE.

Dr. M. Singer, house surgeon of St. Mary's Infirmary, Galveston, Texas, reports the following case in the *Medical Record*, September 25, 1886: "A man, name unknown, aged about 40, was brought to St. Mary's Infirmary on August 5, 1886, at 6 P.M. At about three o'clock in the afternoon he had been found lying unconscious in the street by a police officer, who, supposing him to be drunk, took him to jail. Two hours later the jailer, noticing the deep coma and intense bodily heat, had him

conveyed to the hospital. Upon admission the pulse was 120, full and strong; respiration 40, stertorous, with short intermissions about every five minutes; temperature 108.4°. Skin hot, dry and parched; coma complete; pupils slightly contracted. I gave 50 grains of antipyrin under the skin, applied sinapisms to extremities, and ice on the head. At 7 P.M. the patient's condition was unchanged, every symptom as before. Gave 10 grains of antipyrin under the skin.

"At 8 P.M. the patient's general condition remained the same, except that he had passed his water in bed. Pulse 122; temperature 108.8°. Gave hypodermic 20 grains of antipyrin. At 9.30 P.M. symptoms unchanged, except for the temperature, which now was 109.8°. The excessive heat of skin could well be felt through the patient's shirt and the bed-sheet. Gave hypodermic 20 grains of antipyrin.

"At 11 P.M. pulse 140, weak; temperature 109.8°; respiration 18, stertorous, puffy, sometimes catching and irregular.

"Patient died at 11.30 P.M. Temperature at time of death 110°; post-mortem temperature, taken three-quarters of an hour after death, 108.5°; pupils slightly dilated. The temperature in this case was taken in the axilla. No other antipyretic measures were employed but those mentioned above. I have used the same preparation of antipyrin in many febrile conditions, and in doses of from 20 to 30 grains, without failing at any time to reduce the fever heat. In this case, however, 100 grains of the drug, given under the skin, within a period of three and a half hours, proved to be utterly worthless. No diaphoresis was produced at any time after the administration of the remedy."

ON INSPIRATIONS OF COLD AIR IN FEVER.

DR. IWAN WOITKEWITSCH communicates to the *St. Petersburg Med. Wochenschrift*, No. 24, 1886, his views on the value of cold air inspirations in febrile affections. His observations were made in seventy-one instances, and comprise cases of typhoid fever, pleurisy, and pneumonia. The air was cooled by means of an apparatus constructed for the purpose by Woitkewitsch, and applied to the patient for fifteen to forty-seven minutes. The observer draws the following conclusions:

1. The febrile temperature was lowered by the cold air only immaterially and for a short time.

2. Pulse and respiration, however, were considerably slowed.

3. The general subjective state of health and sleep improved likewise, though for a short time only.

4. The phenomena of the bronchial catarrh decreased to an eminent degree under the influence of cold-air inspirations.

5. The inspirations exerted a favorable influence upon the general course of the disease, and in no instance proved to be injurious.

THE PROPER USE OF ERGOT IN OBSTETRICAL PRACTICE.

From an elaborate paper with the above title, read by DR. FRANK HAMILTON POTTER before the Buffalo Obstetrical Society, the author draws the following conclusions (*Buffalo Med. and Surg. Journ.*, September, 1886):

1. Ergot is a drug which in any of its preparations tends to deteriorate rapidly, and should never be used excepting when prepared from a pure and fresh specimen.

2. It is a stimulant to the tubular and non-striated muscular structures of the body, causing them to contract.

3. It acts especially upon the muscular structure of the uterus, throwing it into a state of tonic spasm.

4. Its action on the uterus is, however, uncertain; sometimes it contracts the entire organ, at others only a small part of it.

5. If the entire organ is contracted, labor may be delayed through the rigidity of the os, and the child destroyed by the interference of the placental circulation.

6. Or the contractions may be so powerful as to force the child at once into the world, causing any or all of the lacerations of the soft parts of the mother.

7. The life of the child may be endangered, also, through absorption of the essential oil of ergot.

8. If given after the birth of the child, and before the expulsion of the placenta and membranes, it may prevent the removal of the latter, and thus be indirectly a cause of puerperal septicæmia.

9. It may act in a similar manner in cases of abortion, actual or threatened, and cause a similar result.

10. The proper use of ergot in obstetrical practice is limited to those cases in which, after the expulsion of the placenta, the uterus refuses to contract, or, having once contracted, shows a tendency to secondary relaxation. Even in these cases, however, reliance should

not be placed upon it alone, but its action should be supplemented by the other means used to provoke uterine contraction.

THE ANTIRHEUMATIC VIRTUES OF ANTIPYRIN.

We abstract from the inaugural essay of Dr. Eich (Basel, 1886) on the antirheumatic virtues of antipyrin some points of general interest.

Of thirty-six cases treated by Dr. Eich (acute and chronic articular rheumatism, acute muscular rheumatism, rheumatismus vagus) all patients but two could be discharged as cured. In one of the two cases the failure was predicted on account of the great anatomical alterations produced by the chronic process in the joints, and in the other salicylic acid given alternately with antipyrin proved likewise useless. Eich concludes from the results obtained that antipyrin owns an exceedingly prompt and reliable antirheumatic power, and is in this respect in no way inferior to the preparations of salicylic acid. Still, Eich continued, the curative action of antipyrin is as little infallible as that of salicylic acid, and appears to possess no greater power to prevent cardiac complications than the latter remedy. In the treatment of affections of the endocardium and the serous membranes Eich saw likewise good effects from the drug. The absence of all secondary effects, however, renders antipyrin more eligible than the preparations of salicylic acid ; at least the two remedies can conveniently supplement each other in case one should fail.

As to the dose, Eich gives at the beginning from 60 to 90 grains, and later only 30 grains *pro die*.

ELECTROLYSIS IN GYNÆCOLOGICAL SURGERY.

At the meeting of the American Gynæcological Society, held in Baltimore last September, Dr. Baker read a paper on the uses of electrolysis in gynæcology (*N. Y. Med. Journ.*, October 16, 1886). The speaker referred more particularly to the use of electrolysis in cases of fibroid tumor, and laid down the following rules for the performance of the operation : It should not be employed within a week before or after menstruation. An anæsthetic should be administered. It was better to use electrolytic needles for both the positive and negative poles ; the operator should be absolutely sure of the cleanliness of the needles ; the needle should be deeply buried in the tumor, in order that the current might be insulated from the parts outside of the growth ; the insertion of the needle should be made at the most prominent part of the growth, whether that was in the vagina or in the abdominal wall ; the needles should not be too nearly approximated ; if both needles were properly placed, the position of the two poles made no difference ; the circuit being completed, the number of cells should be gradually increased from four to twenty or thirty (a more exact means of determining the strength of the current would be the galvanometer, but this had not given him accurate results) ; the length of time during which the application was continued should be from ten to twenty minutes, and should be determined by the character of the pulse. When the pulse became slower and weaker than normal, the number of cells should be diminished or the current discontinued. The current should be diminished gradually, and the wires should be disconnected at the battery before the needles were removed. The applications should not be made at the surgeon's office. After the application, the patient was to be put to bed, where she was to remain for one week. With such precautions, the speaker had never seen shock after the operation. A single treatment was often all that was necessary. He had never found it necessary to make more than three applications, and the latter number in only one case. There should be an interval of at least from one to three months between the applications. The use of electrolysis was also of service in the treatment of inflammatory effusions. Before resorting to electrolytic puncture, the application of the galvanic current should be tried, as it did not require an anæsthetic, and avoided the slight risk which accompanied even small wounds.

The following conclusions were presented : 1. Electrolysis was a useful agent in the treatment of certain cases of fibroid tumors of the uterine walls and of chronic circumscribed perimetric effusion. 2. When applied to fibroid tumors of the uterus, electro-puncture was a most reasonable and efficient method. 3. In the treatment of fibroid tumors by this agent, it was unnecessary to apply it often. 4. Cases of perimetric effusion to be treated by this method should be selected with care in reference to the absence of all acute symptoms.

In the discussion which followed, Dr. Chadwick stated that he had tried electrolysis ten

years ago in one case of fibroid tumor, introducing the needle through the abdominal wall. This had caused a smart attack of peritonitis. During the following year there was no decrease in the size of the tumor. He had also seen abscess follow its use.

Dr. Engelmann said that the dangers mentioned by Dr. Chadwick were those which were liable to follow puncture through the abdominal wall. By puncturing through the vagina, and, if possible, through the tissue of the uterus, the dangers of inflammation which accompany abdominal puncture were avoided.

Dr. James B. Hunter, of New York, could not say that he had seen one case of fibroid tumor permanently relieved by electrolysis. In one case, in which it was freely used by Dr. Freeman and himself, he had subsequently removed the tumor by hysterectomy, the patient making a good recovery. He could find no evidence of the effect of the current on the tissue of the fibroid.

Dr. Mann had employed this agent in one case, plunging one needle into the tumor from behind through Douglas's *cul-de-sac*, with a sponge electrode over the tumor on the outside. The current was kept up fifteen minutes. Six applications were employed. The size of the tumor was much diminished, and the tenderness and pain were lessened. The patient was now able to attend to her duties.

NEW INVESTIGATIONS ABOUT POISONING WITH JEQUIRITY.

We abstract from the *Ann. di Chim. e di Farm.*, No. 2, 1886, the following points of Dr. Bufalini's researches on jequirity:

Jequirity, the seeds of *Abrus precatorius*, Lin., owes its powerfully toxic action to a principle soluble in water, which, introduced through the jugular vein directly into the heart, kills rabbits instantly through cardiac failure. Ingested by some other mode, death is not so rapid. In frogs, the drug causes at first cardiac arrest in diastole, —excitation of the cardiac inhibitory apparatus,—lasting seventeen minutes; later the beats of the heart appear again, the inhibitory apparatus becoming paralyzed. The drug produced in no animal any alterations of the pupils, and led Bufalini to believe that the distinct myosis observed in the course of the jequirity ophthalmia is merely a reflex effect of the keratitic process.

Finally, the observer states that the toxic principle of jequirity is probably identical with abrin, the glycoside found by Hardy, Marden, and Waddel. Abrin foams strongly in water, and changes into glucose under the influence of a diluted acid.

THE LOCAL TREATMENT OF PSEUDO-MEMBRANOUS CROUP—INTUBATION OF THE LARYNX.

Dr. J. Lewis Smith, in an article in the October number of *The American Journal of the Medical Sciences*, expresses his belief that intubation is destined to be employed more generally than tracheotomy in the treatment of pseudo-membranous croup. He maintains that in all cases in which the obstruction is limited to the larynx and trachea, intubation relieves the dyspnœa as quickly, effectually, and permanently as does tracheotomy. It gives, in most instances, complete relief for a time. If the respiration subsequently become embarrassed, and no benefit occur from cleaning the tube, tracheotomy may be required. Intubation may properly precede tracheotomy in most cases.

Not a few parents in the middle and lower classes allow their children to die rather than consent to this operation. On the other hand, few parents will object to intubation, and when they see the relief which it produces they will probably consent more readily to tracheotomy if the dyspnœa should return. If only one of these operations be performed, statistics thus far show nearly as good a result from intubation as from tracheotomy.

Now that diphtheria has become so common the physician should be provided with the necessary instruments for intubation whenever diphtheria appears in his locality. Alkaline and trypsin inhalations, properly and almost constantly used, and intubation performed early, when the patient begins to suffer from dyspnœa, would probably prevent the necessity of tracheotomy in a large proportion of instances. But if such treatment do not fully relieve the dyspnœa, it will in most instances so diminish it and retard the progress of croup that the physician, remote from help and unfavorably situated for the performance of tracheotomy, will have ample time to prepare for this operation. Intubation may prevent the need of tracheotomy, but if not, it presents no hindrance to it.

TREATMENT OF WHOOPING-COUGH.

The *Bull. de Thérapeutique* contains in its May issue a review of various modes of treating pertussis, which invites our interest.

As to the etiology of the disease, authorities like Michel and Hack agree that whooping-cough is a reflex neurosis originating in the nerves of the nose. These therapeutists, therefore, believe in treating the affection by means of powders applied to the nasal mucous membrane. Michel tested the rationale of this treatment in fifty cases, and pronounces the results obtained as satisfactory, in the majority of cases at least. The substances which he used in these cases were quinine, either pure or mixed with benzoic acid in the proportion of one of the former to three of the latter, tannin, boric acid, salicylic acid, iodoform, cocaine, bicarbonate of sodium, and marble-dust. The last-mentioned substance was used in order to study the action of inert powders. In several cases Michel ascribes the curative influence of the agents used simply to their mechanical action. The most effective substances which were tried were quinine, benzoic acid, tannin, and marble-dust; cocaine, salicylic acid, boric acid, and iodoform making very little impression upon the cough, the remedies being only used during the spasmodic phase of the disease. Of the fifty cases treated, all the symptoms of the disease disappeared at the end of eight days in six cases. In six other cases the symptoms were improved, but the duration of the disease was not affected. The weather exercised a marked influence upon the intensity of the disease, the cough becoming more painful and more frequent when it was cold and damp, especially if the wind were east. When the weather became milder and the easterly wind had subsided, the symptoms invariably improved. It was also observed that dampness had a more unfavorable effect than cold.

Sauerhering's plan of exhibiting quinine has been previously discussed in the GAZETTE. This physician professes to cure whooping-cough in from fifteen to twenty days with quinine alone. His doses are very large. To infants he gives 1 grain and more at a dose; to children in the second year of life, 1¾ grains; and in the seventh and eighth, up to 4 grains. The quinine is given with a little sugar, one dose at night, and three doses on each of the following three days. Then there is a respite of three days, after which the same number of doses and in the same manner is to be repeated. The same plan is followed after three days more of rest, and by this time, in the author's experience, the cough has disappeared.*

* Henoch's experience with the method of Sauerhering was wholly negative.

Roger's treatment, when the paroxysms have a convulsive character, consists in the use of the syrup of valerian in doses of ½ to 1 fl. oz., or of the tincture of musk in doses of 5 to 10 drops for children under 2 years of age, and 10 to 20 drops for those between 2 and 5 years. If laryngeal spasms are frequent, he recommends the inhalation of emollient or narcotic vapors, burning in the vicinity of the nose and mouth nitre-paper, stramonium, or belladonna powder. When there are paroxysms of suffocation, he recommends (with Henoch) the inhalations of ether and chloroform. If suffocation seems imminent, he recommends the inhalation of ammonia, the free use of cold water upon the face, and active friction upon the walls of the chest, especially in the region of the heart.

Guerder, discussing likewise the therapeutics of whooping-cough in the *Journal de Médecine de Paris* (June, 1886), places a considerable stress upon thorough disinfection of the sick-room. In an extensive epidemic of pertussis, in February of this year, which was particularly prevalent among very young children, the author treated his cases, at first, by disinfecting the sick-rooms with carbolic acid, and then using a syrup composed of—

Syr. diacodii,
Syr. belladonnæ, āā f℥ii;
Acidi phenici, gtt. x;
Potassii brom., f℥i.

This was administered in doses of a coffee-spoonful once or several times a day, according to the age of the patient. Only a moderate degree of success attended this treatment, and when the medicine was suspended the number of paroxysms became as great as before. The continued use of belladonna was also found very undesirable in young children, as it produced decided dilatation of the pupil, delirium, and a condition of narcosis which it was deemed prudent to remove.

The nasal catarrh which accompanied the disease, the injection of the nasal mucous membrane, and the probable parasitic character of the disease suggested the idea that the paroxysms of cough and asthma were of a reflex character, and might be susceptible to a similar course of treatment to that which has been found efficient in hay-fever. A powder was, therefore, made of equal parts of boric acid and of burnt coffee, and blown upon the nasal mucous membrane morning and evening. Thirty children were thus treated, seven being under 1 year of age, seven between 1 and 2, six between 2 and 3,

ten between 3 and 8. Seventeen of these received almost no treatment except the insufflations, while the others had already received some benefit from the use of the syrup, the formula of which is stated above. In all cases benefit began to be apparent in from two to six days, the paroxysms of coughing becoming less frequent and less intense, the vomiting, the epistaxis, and the nasal catarrh diminishing or disappearing. The general condition also improved, and in fifteen to twenty days the patients were apparently well. This result is the more satisfactory since the cases occurred among poor people surrounded by bad hygienic conditions, and the children were out of doors much of the time in cold and wet weather alike. In those cases in which the insufflations were practised at the beginning of the disease, the course was invariably a mild one, and a cure was effected in eight to fifteen days. Powdered benzoin, which was recently recommended by Michael, of Hamburg, for this disease, to be used also by insufflation, gave good success, but was not so satisfactory as the mixture of pulverized boric acid and pulverized roasted coffee.

In conclusion, we allude to the treatment of Dr. J. Bachem, of Bonn, who blows a mixture of muriate of quinine (three parts) and powdered acacia (one part) in the nostrils once or twice daily. In sixteen cases thus treated he effected a cure after an average treatment of twenty-one days.

Our readers will recall from the therapeutic notes of our special correspondent at Berlin that Henoch regards opium as the only reliable remedial agent in whooping-cough.

NOTHNAGEL ON THE TREATMENT OF PERICARDITIS.

Professor Nothnagel, of Vienna, in a clinical lecture on the treatment of pericarditis, advises that in cases where there is pain in the cardiac region, fever, and the commencement of exudation, leeches, varying in number from three to ten, according to the gravity of the symptoms and the constitution and strength of the patient, should be applied. The leeches should be renewed every four or six days. Cupping may be substituted, but leeches are preferable. An ice-bag should be applied, or a directing apparatus through which cold water can be constantly supplied to the part. Cold compresses are of no use unless they are laid on ice, and then they must be changed every five minutes. Digitalis for internal use is indicated under certain circumstances. It is useful if the cardiac action is greatly increased, especially if there are signs of the heart-muscle becoming implicated, when it should be given in somewhat larger doses. Digitalis is not desirable in the earlier stages of the disease, but in the later ones, when there are signs of weakness of the heart-muscle and the pulse is weak, it is indispensable. Other internal remedies are useless. Mercurialization—viz., calomel in small doses of three-quarters of a grain internally, and gray ointment externally—has no effect. The pain is scarcely ever severe, and if it is persistent it may be relieved by cold and blood-letting. To this a high temperature is no drawback, as the fever subsides as the inflammatory appearances disappear. If effusion has begun, other means must be used, such as counter-irritation of the skin and the promotion of reabsorption. Ice and blood-letting are of no use in this case. The cardiac region must be painted with equal parts of gall and iodine tincture, or an ordinary cantharides plaster may be applied, which should be kept on from eight to twelve hours till a blister is raised. This is of greater use in subacute than in acute pericarditis. Digitalis does not directly promote reabsorption, but indirectly by its influence on the action of the heart. Should the patient's life be threatened by copious effusion, paracentesis of the pericardium must be performed. This operation is often employed, and with not unfavorable results. Great care must be observed; the pointed trocar of Dieulafoy's apparatus must not be used, but a blunt one, like that of Dr. Fraentzel.—*Lancet*, September 4, 1886.

PROPAGATION OF MEASLES BY HEALTHY PERSONS.

From an editorial of *Le Concours Médical*, June 12, 1886, we abstract the following observations:

The possibility of carrying the contagious principle of measles from place to place by the medium of the bodies of healthy persons was recently discussed by the Medical Society of Berlin, and one gentleman, Joel, of Lausanne, presented certain facts, which lead to the belief that such a possibility does exist, and that the medium is often furnished by the physicians themselves. One case which was cited was that of a boy who was brought from Geneva to Lausanne while he was passing through the incubation stages of measles. The butcher and the postman who served the

institution to which the boy was brought conveyed the disease to their children, who were attacked with it in a short space of time, and, what is quite remarkable, the children in almost every house to which the postman delivered letters were attacked. A little girl was brought to a hospital, and in a few days had undoubted symptoms of measles. Her father had paid her several visits before the measles appeared, and it was ascertained that two of his children were suffering at his home from the disease. Eight other children in the hospital were quickly seized with it.

It is thought that physicians cannot always avoid carrying the contagion with them, even when extraordinary care is taken. Prophylactic means on the part of the physician should be as thorough as possible, however, by disinfection, change of garments, and all other available procedures.

Reviews.

RHEUMATISM: ITS NATURE, ITS PATHOLOGY, AND ITS SUCCESSFUL TREATMENT. By T. G. Maclagan, M.D. New York: William Wood & Co., 1886.

Those who are familiar with Dr. Maclagan's earlier work on rheumatism will read this volume with increased interest. Ever since 1876 an advocate of salicin, he now uses the salicyl compounds with almost equal success, though still retaining his original idea of the superior virtues of the former. With his belief in the miasmatic or malarial nature of acute rheumatism any one may differ, but of the value of the salicyl compounds nearly all are satisfied who have employed them to any extent. The author's description of the varieties of rheumatism may challenge the opposition of many. Certainly there is room for doubting at least the dogmatic statement of his first page, where, dividing the disease into acute, subacute, and chronic, he says, "The three forms have originally the same causation." For in order that this should be even superficially true the name "chronic rheumatism" should be strictly limited to those cases which have been originally acute, where the chronic condition has been evidently brought about by a single or repeated acute attack, while the so-called subacute variety is a convenient refuge for other forms of joint trouble and constitutional trouble by no means always clearly rheumatic. Now we believe firmly that there is a rheumatism and that there is a gout, the two diseases differing entirely in the circumstances of their causation and in their effects on the human organism; and we find that Dr. Maclagan at the outset, in describing and defining the varieties of rheumatism, says, "Chronic rheumatism properly so called is a milder form of the subacute variety,"—thereby defining a chronic rheumatism quite unlike that generally described. In fact, chronic rheumatism, according to the author, "is sometimes the precursor . . . of an acute attack,"—"chronic thickening of the fibrous textures involved in the disease." "A sequence of rheumatism" is a condition which exists, when once established, "independently of the rheumatic poison," and is by no means, the author wishes us to understand, chronic rheumatism at all.

Of the duration of the disease the author has necessarily much to say; he places its ordinary term at two or three weeks. The prolonged cases are explained as "those in which the chronic form of the disease follows in the wake of the acute." This, while ingenious, by no means clears up the case, since in such a view we are required to consider the subacute and chronic forms as separate diseases, complicating, invading, and contemporarily occupying the unfortunate subject, while we have already been told that they were one and the same disease, produced by the same cause,—that the subacute was only a milder form of the acute, and the chronic often the mildest of all. Yet the author speaks of "this grafting of the chronic on the acute form." In the light of the author's subsequent remarks on the treatment by salicin and salicylic acid this becomes a matter of some interest. Were it not for that, it might be passed over as only a loose method of description.

Of the seat of this disorder the author entertains decided views. It is "not the fibro-serous tissues generally, but the fibro-serous tissue of the motor apparatus of the body," and "rheumatism is essentially a disease of the motor apparatus." To support this he points to the immunity enjoyed by the periosteum and the dura mater, the fibrous tissue of the liver, spleen, and kidney, the general freedom from attack possessed by the small joints, the articulation of the jaws and ribs, of the atlas and axis. He "never saw or heard of a case in which the articulations of the ribs were involved." All such cases were, of course, gout.

Of the clinical fact that overstrain and fatigue of a part exercise considerable power in a rheumatic attack in determining the loca-

tion of the disease he makes considerable use. "The only internal organ which is habitually the seat of rheumatic inflammation is also the only one whose fibrous textures are habitually subject to strain." The author very properly deems that exposure to damp and cold suffices to produce acute rheumatism. Such exposure, if sufficiently prolonged, may produce gout of a chronic form; but none the less is the author at fault when he says if such were the case it should be "most prevalent in the coldest climate and the coldest weather," for he forgets that extreme cold is dry and dampness is one of his theoretical factors of causation. Any conclusions drawn from the hereditary nature of rheumatism should be closely scrutinized; from the view of an essential contagion or miasm of the disease they tell against it somewhat, as in the case of tubercle, where we must suppose the susceptibility rather than the poison itself to be inherited. The actual fact itself is in dispute. Is acute rheumatism hereditary, or is a certain weakness and vulnerability only of the fibrous tissues hereditary? Do children whose parents were subject to acute rheumatism have it because they, equally with their parents, have suffered from local conditions of cold, dampness, and miasm? The author admits (p. 19) that "the liability to repeated attacks in the same individual equally points to a constitutional predisposition rather than to an external and accidental agency," yet draws from the special characteristics of the disease the conclusion that it is specific and "the result of the action of a special poison."

Special blood poisons the author divides into those which are produced within the system and those which enter from without. He gives us an exhaustive examination of the lactic acid theory, which he demolishes to his own satisfaction. While quoting the experiments of Richardson on the induction of heart lesions by injection of lactic acid, and arguing against their conclusiveness, he fails to mark one cause of doubt which the reviewer witnessed some years ago in a series of similar experiments, where undoubted valvular lesions were found in the dogs injected, but where similar lesions were also found in a second series of dogs killed without experiment and in a condition of apparent health. Dr. Maclagan, however, holds so firmly the miasmatic theory that defects in his own chain of reasoning are of little moment to him. From conditions obviously pointing one way he readily draws a conclusion in the opposite direction.

The lactic acid theory being rejected, the author proceeds to argue for the miasmatic theory. The natural history of rheumatism allies it closely, he thinks, to malarial fevers. Its habitat is similar, its fever is irregular in type; it is, like malaria, uncertain in duration, unless checked by remedies; yet the poison is not the same. Still, he marks the division in rheumatism of two kinds,—intermittent and remittent,—and having established the relationship he gives us an elaborate study of malaria, its nature, and mode of action; and in Chapter X. we read in the opening line, "Acute rheumatism we regard as a form of malarial fever."

In studying the disease the author makes an arbitrary division into rheumatism of the locomotor apparatus and rheumatism of the vasculo-motor apparatus. In these two chapters and the succeeding one on endocarditis, pericarditis, and myocarditis one will find many facts concerning the disease which are generally overlooked, many facts placed in a new and ingenious relationship, and many statements which may challenge dissent from most readers. Read in the light of the most recent views on ulcerative endocarditis, the three last chapters are extremely interesting, though by no means so in the way the author intended.

The author professes to have been led to the use of salicin, with which his name is closely connected, by a study of the plants of low-lying, damp, and rheumatic neighborhoods. As willows and rheumatism both love the water-courses, so, by an easy argument, salicin hates rheumatism; and though the salicylates have almost overpowered the genuine alkaloid, Dr. Maclagan is still faithful to its fortunes, believing it superior in efficacy and safety to its more palatable and cheaper competitors. In the use of his favorite remedy he shows no timidity. "It takes about an ounce of salicin or salicylic acid to remove the acute symptoms. That quantity should be taken within the first sixteen or twenty-four hours." Forty grains every hour is his favorite dose until the acute symptoms begin to yield, then another ounce is administered during the next forty-eight hours, and so on in diminishing quantity, and continued some days after all symptoms of the disease have subsided. Of salicin he says, "It may be gone on with for some time without hesitation, . . . and those treated by it convalesce more quickly than those who take salicylic acid."

In some of the author's recorded cases he reinforces the salicin by bicarbonate of potas-

sium, alone or with potassium iodide. The reason of this he explains by a necessity in some cases for neutralizing the acid (lactic) in the blood and fibrous tissues, while the salicin attacks and destroys the miasm or specific poison of the disease.

In the chapter on "the mode of action of the salicyl compounds in rheumatism" the reader may follow the author's ingenious reasoning, and agree with him if he chooses; but aside from any theory as to its action, we believe that the majority of the profession thoroughly support Dr. Maclagan in the use of the salicylates, and that where dissatisfaction is expressed with the results of this treatment it is because the practitioner has used too small doses from a dread of depression. As to salicin, while its bitterness is a drawback, it is much better borne by the stomach than the mawkish salicylates, and seems to possess certain powers foreign to them. It can undoubtedly arrest the neuralgic pain, which forms the principal source of suffering in many cases. In thoracic rheumatism it acts more certainly and rapidly, and in the case of children its use is freer from that slight suspicion of danger which will intrude in using large doses of the salicylates. We see, in going through the book, no mention of that most valuable salicylate, the salicylate of ammonium,—a salt which theoretically meets any objections urged against the others, and which is less likely to nauseate. It can be prepared extemporaneously by adding in solution fifty grains of ammonium carbonate to sixty of salicylic acid, and has a purely sweet taste and a syrupy consistence.

Ever since the issue of Dr. Maclagan's early paper some ten years ago the reviewer has employed salicin wherever indicated, and is disposed to think as highly of its virtues as does its original discoverer, and it seems to him probable that it may also be useful in other fields than those rheumatic. As a tonic it is decided in its action, as a febrifuge or antipyretic it possesses considerable power, and in obscure malarial attacks it seems to add new force to quinine by its combination. In the vague depression, dull spinal pain, frequent headaches, and general malaise so often brought back to the city from summer sojourn and travel, where quinine fails it will be found often useful, and, although originally an expensive salt, its price is now so low as to render its use in the necessarily large doses feasible everywhere.

The author by no means assents to the view that salicin is converted in the system into salicylic acid; he considers that it is much more probably converted into saligenin, salivetin, and salicylous acid. This is a very nice point and one upon which opinions may differ; we have none. In the matter of relative safety, however, the author's words are of weight. He asserts that salicin may be freely administered to a system depressed by the toxic effects of salicylic acid, and that under its use the toxic effects and rheumatic symptoms disappear together. Upon neither the brain nor heart has he observed it to act unfavorably. These are valuable points. The remainder of his book is occupied by chapters on the treatment of vascular motor rheumatism, the relation of rheumatism and chorea, cerebral rheumatism and rheumatic hyperpyrexia; and the book, as a whole, forms a treatise on this subject,—original, bright, erratic at times, but of great value, whether the reader coincides with or combats the author's peculiar theories. E. W. W.

A Treatise on Electrolysis and its Application to Therapeutical and Surgical Treatment in Disease. By Robert Amory, A.M., M.D., etc. New York: William Wood & Co., 1886.

This is a well-timed book, and deserves the attention of those who are interested in the scientific progress of electricity in medicine and surgery. It reflects, and is no doubt inspired by, the revived interest which is now being taken in this department of therapeutics, and which is, perhaps, the most rational and healthful that has ever characterized it since physicians first applied electricity to the cure of disease. This reformation (if we may so call it) is no doubt partly due to the great development of both the science and art of electricity in the commercial world. The mercantile spirit has given a stimulus to the thorough investigation of the physical and chemical qualities of electricity, and has also devised methods of producing, handling, applying, and measuring it, which have much increased and systematized our knowledge of what can and cannot be accomplished with this subtle agent. Those persons who had the opportunity to visit the Electrical Exhibition in Philadelphia in 1884, and to critically analyze its best features, could not but be struck with the truth of these observations. They must have recognized that the time had come when it was just as necessary, and almost as easy, for the physician to be exact in his methods, and precise in his results, with electricity as in the cases of any other experimenters and workers with it.

It is true that Dr. Amory has taken up one of the most obscure and involved questions of electro-therapeutics, but one which is probably the very foundation of the science. It is doubtful, indeed, whether the time has come when this subject can be treated in books with more than a small profit. This opinion is confirmed by this book. The subject must be more thoroughly worked upon in the laboratory and the clinic before it can be finished up in the study. The book has the merit, however, of laying out the ground and of reviewing the literature of the subject, while it labors at a disadvantage under a great weight of physiological speculation and many tedious reports of cases.

Electrolysis, as our readers know, is the decomposition of fluids, and substances dissolved in them, by the passage through them of an electric current. It depends upon the polar affinity of the elements forming the fluid, the negative elements seeking the positive pole and the positive elements going to the negative. The decomposition of water is the most familiar example of electrolysis, and may be observed by any one having a galvanic battery. In this the hydrogen seeks the negative pole and the oxygen seeks the positive. This decomposition can be accurately measured, and is in exact proportion to the strength and duration of the current. Thus, for every *coulomb* of electricity there will be evolved 0.1764 c.c. of the mixed hydrogen and oxygen gases. If any simple salt is dissolved in the water, it, too, is decomposed, and the acid collects at the positive pole, while the alkaline base flies to the negative. These acids and alkalies, being thus separated, may, in turn, exert their special chemical actions, and this is what is called the *secondary* action in electrolysis. Thus, in the human body, electrolysis having collected certain acids at the positive pole, these acids would exert their power upon the tissues. It is easy to understand that the more complex the fluids submitted to this process the more complex will be the respective accumulations at the two poles, and the more involved will be the secondary chemical actions and reactions of these accumulations, or *ions*, as they are called. It is right at this point, and because of this complexity, that much obscurity rests upon the subject of electrolysis in the human body. These highly organized tissues, constantly changing in the vicissitudes of health and disease, never exactly alike, often inaccessible to our means of inspection, furnish a problem infinitely more complicated than simple saline solutions, which can be reproduced at will, and excite the inquiry whether, after all, our procedures must not for a long while remain empirical, and our results be clinical rather than experimental. This has been the fate of many other therapeutic agents.

These elementary facts of electrolysis have, of course, been known for many years, and physicians long ago sought to avail themselves of them. It is one of the merits of Dr. Amory's book (shared to a like extent by no other book in the English language that we know of) that it gives us much information about these attempts. But Dr. Amory does not confine the use of the word electrolysis to the decomposing process above mentioned. In fact, he does not believe that this process can account for many of the clinical facts with which we are acquainted. He believes that the *cataphoric* action of the current, or, as he calls it, electrical *osmosis*, is the cause of many of these effects. He illustrates this as follows: "If two platinum electrodes should be connected with a constant galvanic current from ten or twelve cells, and then be immersed in pure water, the negative or zinc terminal within a porous vessel, and the positive or carbon terminal outside of this porous medium, the water in the inner vessel will accumulate in two hours to a level about one-sixth higher than that in the outside" (p. 291). In other words, there is a flow of the fluid through a porous septum from the positive towards the negative pole. Dr. Amory makes this one physical fact the basis for a vast amount of speculation, which is both wearisome and profitless. He offers few, if any, facts or experimental observations of his own or others to enforce his various theories, but relies very much upon badly-reported cases, which he has collected from authors, some of whom have been very much discredited. This seems to us to be the most serious fault in the book. It becomes in parts as occult and speculative as any electropath could wish, and is, moreover, drawn out with a wordy tedium which we often wish had been spared. The author, for an example, believes that the segmentation and proliferation of protoplasmic cells can be influenced by this process, for, he says, "It is not only that electricity may transport fluid particles *en masse* from the positive to the negative electrode; but this transportation of fluids may induce organic changes by the rapid removal of the pabulum upon which these cells depend for their maintenance and propagation" (p. 290). This may

or may not be true; but it certainly needs not so many closely-printed pages to develop an idea which the author himself introduces as a *may-be*. This biological speculation, on the one hand, and the haphazard application of the current (without measurement, without exact observation and unbiased reports), on the other hand, as in most of the cases in this book, cannot impart to our electro-therapeutics either the dignity of a science or the usefulness of an art. There is truth in both electrolysis and osmosis, and experimental observations, it is hoped, will yet make us much better acquainted with them. In the mean time clinical work may follow such indications as these processes can now give us, and especially report accurately both methods and results. The cases which are compiled in Dr. Amory's book—many of them, at least—seem to us to be so meagrely and badly reported, and with so much prejudice, as to be quite useless. What experimental therapeutist would think of reporting his results with a new drug, and at the same time omit to mention the dose and about one-half of the details? And yet this is an almost universal fault with electro-therapeutists. The author's own cases of goitre, treated by galvano-puncture, are decidedly the best and most instructive in the book. We wish he had relied more upon his own observations in other diseases.

This treatise, in spite of the faults which have been mentioned, appears to us to be both useful and suggestive in a number of ways; and, in order to do it perfect justice, as well as to do the reader a service, we will briefly indicate its contents. The first half of the book, or about one hundred and forty-seven pages, is devoted to the theory of the subject. The physical relations of electrolysis and electrical osmosis are given, and the authorities on these abstruse subjects are referred to in sufficient detail. The various forms of batteries are mentioned in about the same manner as in our better text-books on medical electricity. The author uses the word *tension* very often, and in a way that is sometimes confusing. We thought that this word had about seen its last days. We can understand *current-strength* and *quantity*, which are the facts which regulate electrolysis and all other applications of electricity to the human body, but *tension* in electro-therapeutics has become as dubious a term as *high potencies* in another branch of therapeutics. About twenty-five pages are devoted to a theory of the destruction of living tissues by electrolysis, of which we have given our impression above. It all remains to be demonstrated. A chapter upon the methods of employing electrolysis in living tissues is practical and good. The last half of the book is devoted to certain diseases in which electrolysis has been practised, and draws largely upon the experience of those who have made clinical trials of the method, and who are in general best known for their efforts. A table of reported cases has value chiefly as an index. It is too like a skeleton for any one to taste of the meat. We have, however, much from Cinicelli, who has made valuable studies of electrolysis in aneurism, and many other refences, which give this book marked literary value. The reader will be interested to read of the cure of a leucoma by galvano-puncture with a delicate needle, and amused to read of another case of the same disease in which, instead of the needle, a *wet sponge* was held over the *closed eye*, and, of course, no cure was obtained. These two cases illustrate the rational practice, which is rare, and the haphazard practice, which is common, in the use of electricity. The author reviews the subject of electrolysis in ovarian tumor, which was heralded some years since as about to abolish ovariotomy, and appears to give more credence to Ehrenstein than would be expected. Ehrenstein claimed to have cured several hundred cases of abdominal tumors, but never gave any particulars that could be relied upon, and was proved by Dr. Mundé to be a visionary.* Dr. Amory thinks that electrical osmosis here plays its part. Sceptics have said that the tumors are reduced by oozing from the punctures. Among many other diseases treated are hydrocele, nævus, and cancer. Some of these cases are undoubted cures, and therefore very valuable. The use of electricity in the hyperplasias of the female pelvis, and in stricture of the male urethra, has not received the notice it requires. Exophthalmic goitre receives a great deal of attention from Dr. Amory, and it is exceedingly irksome to have to read, in such a work as this, *twenty-nine* closely-printed pages of the pathology and symptoms of the disease before we come to the practice. Whatever his theory may merit, it is certain that some of the results obtained by him are very striking and worthy of imitation. Hypertrichosis, or supernumerary and abnormal hairs, and their removal by electrolysis, receives the attention which the

* Transactions of the American Gynæcological Association, 1877.

subject deserves in a very complete chapter. One of the closing chapters is devoted to measurements of the current-strength, and testifies to the author's zeal as a scientist. Apparatus is well described, and a general summary brings the work to a close. We may say, by way of final criticism, that the book could have been much more concisely written, and that the whole subject must be more thoroughly established by practice and observation; but, also, that Dr. Amory has rendered a genuine service to those who interest themselves in the use of electricity in disease. J. H. L.

THE MEDICAL DIGEST, OR BUSY PRACTITIONER'S VADE MECUM: BEING A MEANS OF READILY ACQUIRING INFORMATION UPON THE PRINCIPAL CONTRIBUTIONS TO MEDICAL SCIENCE DURING THE LAST THIRTY-FIVE YEARS. By Richard Neale, M.D. London, etc. Second Edition.
London: Ledger, Smith & Co., St. Mary Axe.

The publishers of Neale's "Digest," desirous of an expression of opinion as to the advisability of issuing an appendix every fifth year, call attention to the subject by a leaflet accompanying the work, the heading of which, "How to Use the 'Digest,'" indicates its purpose. In it the author again protests against the idea that the book is "merely an index" to certain specified journals, and contends that it is far more, a true digest, from whose pages, by a little trouble, the practitioner, without access to the journals referred to, can yet gather an immense amount of valuable information and useful suggestions on any topic that occurs to him. That this claim is true a very little study of the book in the lines indicated by the leaflet will convince any one, for as each reference leads to others, the very titles of the articles give new ideas on the subject.

But we should judge that this use of the book was altogether inferior to the evident use of it as an index after all. As a means of reference to all important medical journal literature in the last thirty-five years it is to the student and writer invaluable, and to the occasional writer still more so. In fact, it is only by means of such a book that elaborate and studied articles can be written, and the issue of another appendix in 1887 will be hailed with joy by thousands of students and writers. The journals which have contributed to form this book, and to research in which the book contributes, are the *Am. Jour. Med. Sci.*, *Braithwaite*, *British Medical*, *Lancet*, *Med. Press and Circular*, *British and For. Med.-Chir. Rev.*, *London Med. Gaz.*, "Royal London Ophthal. Hosp. Rep.," *Ranking's Abstracts*, *London Med. Rec.*, *Med. Times and Gazette*, *Practitioner*, *Edinburgh Journal*, and a number of standard books besides.

Correspondence.

BICHLORIDE OF MERCURY IN UTERINE CATARRH.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—Since January last I have been using a solution of bichloride of mercury as an application to the cervical canal and uterine cavity in cases of chronic mucopurulent discharge. Originally it was suggested to my mind by some considerable success with the same agent in gonorrhœa, as recently recommended. The suspected relation between many chronic inflammatory conditions of the female genital organs and gonorrhœa still further suggested the use of the bichloride, though in much stronger solution. ½ to 1 grain to the ounce of water was the strength I employed, and, on trying it, my success was so much better than ever before that I have continued to use it in all possible cases of the kind. It has several manifest advantages. Applied with the cotton-wrapped applicator, it excites no immediate uterine contraction, as iodine, carbolic acid, and other agents generally do. This enables one to make two, three, or more applications in rapid succession, and affords a much better chance for reaching the entire endometrium. It leaves behind it no coagulated mucus, or film of chemically-altered epithelium, as carbolic acid and nitrate of silver do, to be detached and expelled subsequently by a process almost necessarily involving fresh suppuration. A similar solution may, as a final measure, be applied to the whole vaginal membrane as the speculum is withdrawn, and irrigation with hot water or a very weak solution of bichloride continued for some days. In obstinate catarrh of the cervix, with almost endless ropy secretion, I have also had good success, while I do not remember, after many trials, any success worth mentioning with any agent employed previously. In nearly all the cases two or three applications entirely checked discharges of long standing. Sometimes they recurred at the monthlies, but were again checked for good apparently by another application. In two cases single applications did the work, and out of the twenty-three cases treated solely in

this way, two only resisted treatment, and were entire failures.

E. W. WATSON, M.D.
131 N. TWENTIETH ST., PHILADELPHIA.

IS IT SAFE TO GIVE PEPSIN PREPARATIONS WHEN LESIONS OF THE MUCOUS MEMBRANE EXIST?

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—At the time I read the article on pepsin in the September number of the THERAPEUTIC GAZETTE, I was treating what I and my consulting physician considered to be a case of septicæmia following on a dysentery, in which pepsin had been used. This case I will briefly state.

The man was in his prime, temperate, industrious. He came down with dysentery, which yielded in ten or twelve days, with no very extraordinary symptoms. His pulse and temperature subsided, and appetite, with normal discharges, returned. During the last of his sickness preparations of milk and of egg were frequently given in connection with "dyspepsin," with no thought of any danger. When convalescence was so satisfactory, and every symptom favorable for a speedy recovery, on the fourteenth day he was suddenly taken worse,—a chill, pulse 125, temperature 104°, pain in neck, with rapidly increasing purple swelling in left parotid and the surrounding tissues. To this swelling tincture of iodine was applied and proved advantageous in relieving and reducing the swelling, though not wholly saving from suppuration. An active diarrhœa began with the relapse, and continued till the last, hypodermic doses of morphine and belladonna alone seeming to be of any benefit. After three or four days there were some symptoms of peritonitis, though not strongly marked. The mind remained clear, with slight exceptions, till the last, when death took place, twenty-one days from the beginning of the sickness, or seven days after relapse.

What was the matter? Why this set-back, or, rather, this new series of symptoms? He was so carefully watched and treated we know of nothing, unless the pepsin had entered the circulation through the ulcerated bowels and poisoned the blood. Of this I had no idea till I read Dr. Wood's article. Is it possible pepsin is dangerous when conditions exist favorable to its absorption into the circulation? If so, we have a hint to the possible cause of the frequent cases of blood-poisoning in the modern wholesale use of the digestive ferments. It is, indeed, time that the whole subject of these ferments was gone over and the danger pointed out, if danger there be, and the line of demarcation sharply drawn between the cases when their use is safe and when it is not.

At this writing I have a case of typhoid fever, where, a few weeks ago, I should have resorted to pepsin in some form, but now I dare not give it. If pepsin is poisonous to the blood, then it must be regarded dangerous in any case where there is lesion in any part of the alimentary tract over which it may pass and be absorbed.

E. CHENERY, M.D.
65 CHANDLER ST., BOSTON, MASS.,
October 28, 1886.

Notes and Queries.

SQUILL A POISON.

The death in March last of two young children from large doses of a cough mixture containing syrup of squill called attention to the danger attendant on the unrestricted use of this popular cough remedy. A long paper in the last two numbers of the *Lancet* by DR. E. B. TRUMAN, F.C.S., public analyst for the borough of Nottingham, detailing the results of his examination of the mixture which was used and some other experiments, recalls the circumstances of the case. The mixture which was used contained almond oil, 2 drachms; syrup of violets, 4½ drachms; ipecacuanha wine, 1½ drachms; and syrup of squill, 1 ounce. It caused pains in the legs, a livid appearance of the face, and quick respiration, followed in two cases by death. The post-mortem examination showed that the heart had ceased in systole, a phenomenon which only results in the case of three officinal drugs, viz., digitalis, squill, and green hellebore. The supposition was that digitalis had accidentally been dispensed in place of one of the ingredients of the mixture, and Dr. Truman was asked to make a chemical examination of the remaining portion of the mixture. He did so, but found no indication of the presence of digitalis, and subsequent experiments with syrup of squill, and other ingredients of the mixture, procured from the pharmacist who dispensed it, pointed to squill as being the toxic agent. Samples of the syrup were obtained from other sources, and these, along with the first syrup, ipecacuanha wine, tinctures of digitalis, and green hellebore and digitaline, were used in physiological experi-

ments upon the heart of the frog. The result of the experiments shows that while the glucosidal residue from 30 minims of the fatal syrup of squill caused cessation of the heart's action in thirty-eight minutes, a similar quantity of another sample reduced the beats from thirty to ten in forty-seven minutes, and another had scarcely any action at all. Ten minims of tincture of digitalis reduced the number of beats from thirty-nine to eighteen in twenty minutes, and 110 minims of tr. verat. virid. reduced the number from fourteen to six in twenty-five minutes. A proportionate quantity of the fatal mixture also caused cessation of the heart's action. There was no doubt, therefore, that squill was the toxic ingredient of the mixture, and this is the conclusion that Dr. Truman arrived at. The syrup used in this instance had an intense and persistent bitter taste, like that of scillitoxine, the glucoside of squill which arrests the heart's action in systole. From his experiments, Dr. Truman concludes that squill varies in strength, as the different effects of the three syrups show. The outer scales are stronger than the inner, because they contain more scillain; the fresh bulb is stronger than the dried, volatile oil and Landerer's extractive being lost in drying; the bulb gathered in summer is stronger than that gathered in autumn,—in summer the squill contains less sugar, and the increase of sugar in the autumn is probably the result of decomposition of the glucosides; the red variety is stronger than the white. Dr. Truman is also of opinion (1) that squill is not a safe drug to use for routine, and especially popular or lay practice; (2) that being so variable and, when strong, so potent a drug, it should be looked upon by the profession as unsuitable for use until a solution of standard strength can be produced; and (3) that in the mean while its use should be discontinued. These conclusions, although apparently justified by the facts of the case, cannot be accepted straight off. Dr. Truman has undoubtedly done good service in going into the matter so thoroughly, but there are several moot points remaining. The squill which was used for preparing the syrup was not forthcoming, and we cannot therefore say whether it was exceptionally toxic or whether the preparation was improperly made. Moreover, although the pink variety of squill is admitted by the Pharmacopœia, we do not recollect having ever seen it in commerce; certainly it is so uncommon that pharmacists would not use it if it were supplied to them. We are at one with Dr. Truman on other pharmacological points, and trust that some competent pharmacist will make a thorough chemical examination of the squills of commerce, and determine, if possible, a simple means of ascertaining its strength. An isolated case of poisoning does not justify the proposed discontinuance of the drug, but the caution is necessary for mothers who give their children half-teaspoonful and teaspoonful doses of the syrup when a few drops would act sufficiently as an expectorant. If there were a much weaker syrup—for example, one containing an ounce or two ounces of acetum scillæ in a pint of simple syrup—the likelihood of fatal cases occurring would be very small indeed.—*Chemist and Druggist*, September 11, 1886.

ON RHEUMATISM.

IMMERMANN'S remarks about rheumatism were attentively listened to at the Berlin Congress, though no new features of an etiological or therapeutical nature were presented. The well-known fact of the frequence of the affection in one and the same house was again referred to. Immermann questioned whether cold is productive of rheumatism.

THE REMOTE EFFECTS OF REMEDIES.

At the meeting of the Medical Section of the British Medical Association, the President, DR. BROADBENT, selected for the subject of his address the Remote Effects of Remedies. After referring to the well-known after-effects of alcohol, he alluded to the mental and bodily derangement induced by eating opium, the miserable irresolution and wretchedness of the man who habitually resorts to chloral, and the childish dementia brought on by the prolonged use of the bromides. He thought that coca is already beginning to claim its victims, who gradually develop an excitement which becomes maniacal or an exaltation like that of general paralysis. The subject of gout was given as illustrating the remote effect of remedies. The effect produced by continued and excessive use of colchicum and other drugs having a similar action, and the consequences following the neglect of such treatment which will clear the system of the gout poison, were especially drawn attention to. With reference to the latter he urged: "It can scarcely be too often repeated that all the effects upon the arteries on the one hand and

the heart on the other associated with contracted granular kidney,—viz., arterial degeneration, cerebral hemorrhage, aneurism and dilatation of the left ventricle, and valvular disease,—are just as commonly produced independently of kidney-disease by high pressure in the arterial system due to other causes; and such pressure in an extreme degree may be induced prematurely by the means taken to keep down gout." Another cause of injuriously high arterial tension was the "Banting" treatment of obesity as understood by the public. In this the non-nitrogenous sugars and starches were taken very sparingly, the amount of fluid taken into the system was reduced as much as possible, and the subject lived on a highly nitrogenous diet. The imperfectly oxidized nitrogenized waste present in the blood provoked resistance in the capillaries, and generated tension in the arteries. Exercise and an adequate supply of water, which were generally omitted, were essential to active metabolism and the working off of impurities. Another example of injury given was that furnished in asthma. Certain drugs afford alleviation of symptoms, but many popular powders contain powerful alkaloids, which produce after-effects on the nervous and vascular systems. "When we see the stupefied mental condition and the congested face and eyes, and note the large, weak, sluggish pulse, showing paralysis of the arterial walls, it is clear that such effects cannot be indefinitely repeated with impunity." "The right ventricle loses its tone like the muscular coats of the arteries, and, instead of becoming hypertrophied, yields to the resistance in the pulmonary circulation, and is dilated, finally giving rise to systemic venous stasis and dropsy." A striking illustration of his subject was given by the too careful and restricted diet of certain forms of so-called indigestion. One kind of food after another was left off, but still with the same discomfort and a sense of repletion after food. The appetite being wanting, a starvation point becomes almost reached. Instances of severe neuralgia, spurious attacks of angina pectoris, and serious debility were related as having followed this line of treatment. Again, in the winter indigestion of women and weakly men, the functional energy of the stomach required stimulating by extra food, such as beef-tea, egg-flip, stimulants at meals, and tonics. What was wanted in winter indigestion was protection from the depressing influence of cold or the means of neutralizing it.—*Lancet*, August 21, 1886.

IS PETROLEUM POISONOUS?

The *Archiv de Pharmacie*, No. 3, 1886, gives the following description of a case of poisoning with petroleum:

A woman took with suicidal intent half a pint of petroleum. Soon after ingestion of the substance she experienced a burning sensation in throat and stomach, and complained of intense thirst. She received milk and cold applications to her head. The urine showed during the first four days evidences of being mixed with petroleum, which partly appeared at the surface and partly in a state of an emulsion. On the fifth day no more petroleum was discharged by the urine. The urinary sediment contained numerous epithelial cells, cylinders, and oxalate of lime; a small amount of albumen was also present. In five more days the urine was wholly normal.

The rapid elimination of the petroleum, and the quick disappearance of all morbid symptoms of the case, induce Dr. Choay, under whose observation the case came, to declare that petroleum is not a poisonous agent.

If there were no other instances of petroleum intoxication recorded in medical literature, we think the presence of cylinders and of albumen to be sufficient evidences for the toxic nature of petroleum.

AN IMPROMPTU STOMACH-PUMP.

Dr. Charles N. Dixon Jones, of Brooklyn, writes to the *Medical Record*, October 16, 1886, as follows: "Apropos of the article on 'An Impromptu Pump for Stomach Irrigation,' by Dr. S. E. Post, allow me to relate the following instance of inventive ingenuity. About four months ago I provided a patient, suffering with gastric catarrh and dilatation, with the simple siphon apparatus and a cocaine solution, for stomach irrigation. From experience he found that the siphon did not at all times act as satisfactorily as was desirable, so he resorted to the following modification: He obtained a three-way stop-cock, made from gas-pipe. To one limb of the stop-cock he attached the stomach-tube; to the opposite limb a large fountain-syringe was attached by means of rubber tubing; the outlet was connected with a rubber tube, to the extremity of which could be attached a large rubber-bag syringe, such as is commonly used for a flower-sprinkler. The apparatus is worked as follows: The stomach-tube is in-

troduced, and then the stop-cock so manipulated as to allow the fluid to flow directly from the fountain-syringe into the stomach. After sufficient fluid has flowed into the stomach, the stop-cock is turned, so that the fluid may flow back through the outlet. If it does not flow readily, the bag-syringe is attached, and by compressing this a few times a powerful suction force is induced. At the same time compression of the syringe a few times in rapid succession will cause a swashing and churning of the fluid contained in the stomach, so that the walls are thoroughly cleansed. Of course, such an instrument is capable of numerous modifications and improvements, but this gentleman constructed it to meet a special indication, and, as far as I know, independently of any knowledge of the use of the principle involved in medicine."

THE ADVANTAGES AND DISADVANTAGES OF HUMAN AND ANIMAL LYMPH.

The proceedings of the Section of Public Medicine at the meeting of the British Medical Association at Brighton terminated with a paper by SURGEON-MAJOR PRINGLE, on the "Advantages and Disadvantages of Human and Animal Lymph." He pointed out that his object in making this comparison was that, judging from the report of the German Vaccination Commission, published in 1885, and very carefully condensed by Dr. E. J. Edwardes, the preference, as given by this very important commission, was undoubtedly in favor of animal lymph. The necessity advanced by the opponents of human lymph for the substitution of animal for human lymph was based on the following four objections: 1. The supposed deficiency in the protective power of human lymph, owing to some unaccountable deterioration in this principle, caused by the passage of the virus through the systems of so many individuals. 2. The danger to health and life, owing to the possible introduction into the system of syphilis or the infection of erysipelas. 3. The difficulty of obtaining sufficient human lymph for any sudden emergency or great demand. 4. The general objection raised to the withdrawal of lymph for other operations. Animal lymph, the speaker said, was supposed to overcome these four objections, as follows: 1. Animal lymph could never become deficient in protective power, owing to its constant reinvigoration from the calf. 2. The dangers to health and life, owing to the possible introduction into the system with human lymph of syphilis and the infection of erysipelas, could not occur where animal lymph was employed. 3. As long as suitable calves were obtainable, it was maintained that the supply of animal lymph, to meet any emergency or great demand, was inexhaustible. 4. For the same reason, no possible objection could be raised under this point. Dr. Pringle then met the four objections brought forward against human lymph. 1. The objection under the head of deficiency of protective power. In Dr. Pringle's extensive and prolonged vaccine practice in India, details of which he gave, he maintained that, where carefully and systematically practised by arm-to-arm vaccination, this deterioration was unknown, and this was certainly not due to the absence of smallpox contagion or infection. 2. There was a complete absence in the above practice of any risks as regards syphilitic transference, and the infection of erysipelas was unknown. 3. With a properly instructed vaccine staff this limited supply of human lymph was unknown, and where the number of children was small, the knowledge of storing lymph prevented any difficulties under this head. 4. Mutual confidence between the vaccinator and the parents of the children would satisfactorily overcome any difficulty regarding the withdrawal of lymph for future operations. Dr. Pringle argued against the view that animal lymph was more protective than humanized, and quoted an official report in support of the view that a spurious vaccination could exist for years. Further, that blood-poisoning, although not of a syphilitic character, might follow the use of animal as well as humanized lymph, that animal lymph was incapable of storage or despatch with any certainty, and that, unless squeezed out with clamps and forceps, the contents of six vesicles would only supply sufficient material for the inoculation of one person.—*Lancet*, August 21, 1886.

TINCTURA FERRI CITRO-CHLORIDI (TINCTURE OF CITRO-CHLORIDE OF IRON—TASTELESS TINCTURE OF IRON).

℞ Solution of chloride of iron (U. S. P.), 4 ℥;
Citric acid, 2100 grs.;
Bicarbonate of sodium, 2270 grs.;
Alcohol, 4 ℥;
Water, q.s. ad 16 ℥.

Dissolve the citric acid in 4 fluidounces of water, heat the solution to the boiling-point, and gradually add the bicarbonate of sodium. When effervescence has ceased, add the solution of chloride of iron, and cool the mixture. Then add enough water to make it measure 12

fluidounces, and finally add the alcohol. Each fluidrachm contains about 7½ grains of dry ferric chloride.

NOTE.—This tincture is approximately of the same strength, in metallic iron, as the official tinctura ferri chloridi.—*National Druggist*, September 10, 1886.

ABSYNTHIN.

According to Merck, the bitter element of the *Artemisia absynthium* L. is easily soluble in alcohol, also in chloroform, less soluble in ether, and almost insoluble in water.

As a remedy against fever it has been tried without much, if any, success. Small doses stimulate, larger doses intoxicate and produce nausea. ROUX recommends the absynthin in doses of 0.1 to 0.25 grm. twice daily, fifteen minutes before meals, to create appetite and to prevent constipation, for convalescents and in cases of chlorosis. If there exists a tendency to diarrhœa, he objects to its use. The remedy may be given in gelatin-capsules and in connection with other medicines, such as nitrate of bismuth, etc.

EXPERIMENTAL STUDIES OF KEPHIR.

We abstract the following *résumé* regarding kephir from the *Verhandlungen der Med. Gesellschaft zu Würzburg*, 1886, 4, xix. The observations were all made on patients reduced by exhausting diseases, such as diarrhœa, anæmia, and tuberculosis.

1. Kephir increases the urinary secretion appreciably only when used in large quantities.

2. The specific gravity of the urine and the total weight of the solids in the urine sink under the influence of kephir.

3. The nitrogenous tissue-changes are checked.

4. Digestive energy and nutrition in general are invariably raised even in the most exhausted individual.

5. The bodily weight increased materially.

6. The number of the red blood-corpuscles increases.

7. The pains of lung and stomach affections subside in a few days.

8. The sleep becomes more quiet and more refreshing.

9. The body becomes rounder and fuller.

10. The pallor of the face yields to a fresh and red color.

11. Hence we must regard kephir as one of the most effective of all means to recover the physical powers after a long or exhausting affection.

ON APON.

What is apon? A new antipyretic and hypnotic? Neither, but simply the name* given by DR. POULET to a tincture prepared by himself, according to the *Bull. de Thérapeutique*, as follows:

℞ Tr. capsici, 200.0;
Ammon. liquidi, 100.0;
Essentiæ thymi,
Hydrati chloralis, āā 10.0;
Alcoholis (sixty per cent.), 1000.0.

The pepper is digested with the alcohol and the ammonia for a month, then the essence and the hydrate of chloral are added to the expressed liquid, and finally the whole is preserved in a hermetically-closed bottle.

Apon applied locally has been found of great value in hysterical pains, general muscular cold, angina, influenza, muscular rheumatism, dysentery, enteritis, hemorrhoids, seasickness, and suppressed sweats. It is applied on a flannel rag, either pure or mixed, with a fatty oil. Internally, 10 to 20 drops may be given in a little water; shortly after that half a glass of water or tea is drank.

IODIDE OF POTASSIUM IN DIPHTHERIA.

DR. STEPF, of Nuremberg, proposed in the *Deutsche Medicinische Wochenschrift*, No. 9, 1886, iodide of potassium as a remedy for diphtheria. He says,—

"Iodine is a direct remedy for diphtheria, because it can be ingested for a long time, and, circulating in the blood, kills the bacteria. We can give iodide of potassium combined with the tincture of iodine; a two to four per cent. solution recommends itself for the first three years of life, and a four to ten per cent. solution for older children, a teaspoonful being given hourly."

Stepf claims to have had success with this mode of medication.

A REMEDY AGAINST EPILEPSY.

℞ Extr. fab. Calabar., gr. viiss;
Spir. æth., fʒiss;
Aq. amygd. amar.
(sive Aq. menthæ pip.), fʒvss. M.

S.—Five to eight drops t. d. for children,
Eight to fifteen drops t. d. for adults.

—*Pharm. Zeitschr. f. Russland*, June 1, 1886.

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* ἀπονος,—painless.